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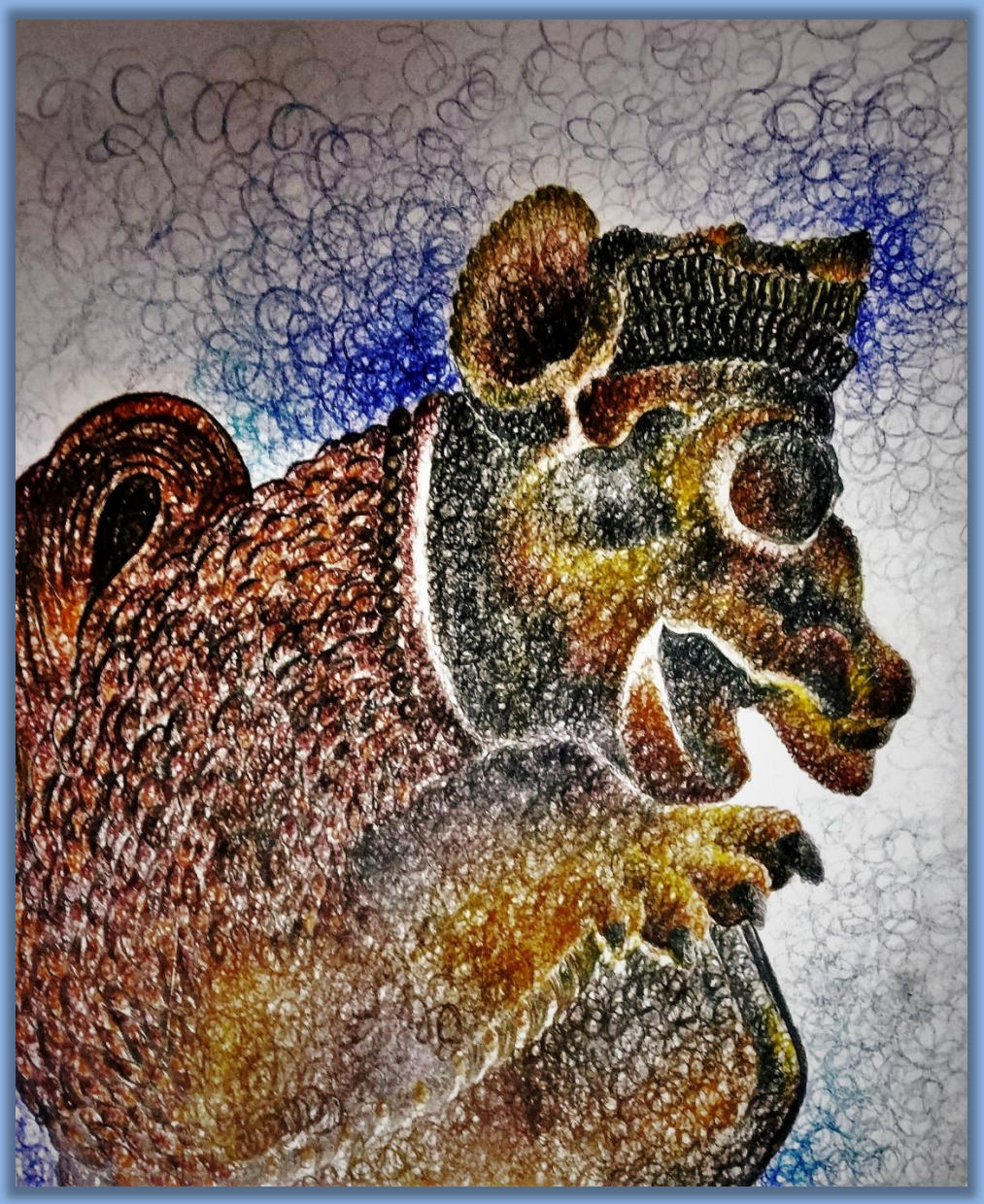

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Editorial

A reappraisal of the evidence of non-pharmacological intervention for people with dementia

Yohko Maki

Abstract

Evidence-based practice is recommended in clinical practice including care for people with dementia, despite lacking robust evidence. Reappraisal of the evidence with detailed examination of the protocols can be effective to promote evidence-based practice and to bridge the research-practice gap in non-pharmacological practice including care for people with dementia.

Key words

Dementia, evidence-based practice, non-pharmacological intervention, protocol, research-practice gap

Evidence-based practice is recommended in clinical practice and the same holds true for non-pharmacological approaches including care for people with dementia. However, there has been a long dispute on the research-practice gap, which may be more critical in non-pharmacological approaches than pharmacological treatment.[1,2] The purpose of evidence-based practice is enhancement of the quality of medical treatment; thus, evidence for it in line with clinical practice needs to be obtained. Regarding non-pharmacological approaches for dementia, meta-analyses in the Cochrane Review have failed to provide robust evidence for their effectiveness.[3,4] In response, researchers have called for quality studies that strictly specify precise forms of intervention and yield reproducible results.

Here, essential difference between pharmacological and non-pharmacological intervention should be taken into consideration when discussing quality of evidence. A pharmacological intervention involves administering the same drug to patients. If the same rationale was applied to non-pharmacological therapies, then certain forms of interventions would be specified and those interventions would be implemented uniformly. Generally, concerning non-pharmacological intervention, the question arises whether such an approach would expand the research-practice gap. Non-pharmacological approach is essentially an intervention that is both person-centered and tailored.[5] Especially for dementia care, person-centered and tailored approaches are basic principles. Here, evidence-based practice is required for clinical decision-making, and consequently, the quality of evidence needs to be determined based on whether evidence is a reliable rationale for clinical decision-making.

The quality of evidence for non-pharmacological therapies should be evaluated differently than that for pharmacological therapies. First, if evidence facilitates clinical practice, then a tailor-made trial (in accordance with a tailor-made intervention for actual patients) is an appropriate way to close the research-practice gap. A pioneering interventions is the Tailored Activity Program (TAP) devised by Gitlin et al., and evidence of randomized controlled trials (RCTs) comparing tailored intervention and control has been reported.[6,7] TAP is an innovative home-based intervention, in which a therapist identifies interests and capabilities of a person with dementia, develops and tailors activities to his/her ability and interests, and trains family members in use of activities as part of their daily care routines under supervision of the therapist.

In a tailored approach, the intervention protocol is substantially significant. A tailored protocol is not an arbitrary intervention devised for an individual patient. Instead, it is an attempt to reveal the process of a number of clinical judgments based on objective assessments. If a protocol is invalid, then results indicating statistically significant differences do not warrant the use of that protocol in medical care. Accordingly, the protocol for the intervention needs to be appraised. Drafting a protocol in non-pharmacological approaches corresponds to developing drugs in pharmacological approaches. A drug is developed through a number of studies that begin with animal experiments. A drug becomes more uniform through research during its development. On the contrary, the form of a tailored intervention is repeatedly chosen based on an objective assessment, and the forms of those interventions differ throughout the plan-do-see-act cycle. Thus, the direction of the tailored non-pharmacological trials is divergent rather than seeking common uniformity and convergence, as pharmacological trials would entail.

As mentioned above, the quality of protocols of interventions needs to be appraised in order to bridge the research-practice gap and promote evidence-based practice. However, there is essentially no way to validate a protocol for non-pharmacological therapies, whereas a

drug is developed through research in multiple stages. Usually, a protocol is devised based on clinical knowledge and experience, but protocol validation is desirable, and the process of validation required for non-pharmacological intervention should be different from that for pharmacological intervention.

One proposal to ensure objectivity is to apply a consensus-building method such as the Delphi method when devising a protocol among co-researchers, and it is desirable to have the protocol reviewed by third parties. Researchers may be expected to attempt to enhance the objectivity of the intervention protocols. Besides, to guarantee the reproducibility, it is desirable to disclose the protocols that describe the process of clinical judgments based on objective assessments. It is recommended that the researchers cooperate voluntarily to improve the effectiveness of evidence-based practice.

Another problem concerning quality of evidence is that many interventions involve a small number of subjects, while a meta-analysis of studies of non-pharmacological interventions may be of little significance due to the heterogeneity of the interventions. Besides, there are more sources of variability that influence the quality of research on non-pharmacological interventions. As a noteworthy issue, methodological issues in blinding of non-pharmacological interventions are always challenging. In interpreting research findings, interventions in the control group are also carefully considered. For example, the control groups often receive usual care, which includes the full spectrum of care practices. Furthermore, the quality of adherence to interventions, which is a critical factor in interpreting effects, is difficult to measure quantitatively. As non-pharmacological interventions are essentially person-centered and tailored, interventions tend to be elaborate, and conducted with a small number of participants. Due to heterogeneity of protocols of the intervention, the quality of individual studies need to be evaluated specifically based on its protocol. In this sense too, the disclosure of the protocol is desired.

Returning to the issues concerning evidence-based practice for people with dementia, the American Psychiatric Association considers non-pharmacological therapies to be the treatment of choice for the behavioral and psychological symptoms of dementia (BPSD),[8] while it is regarded that there is no robust evidence for non-pharmacological therapies for people with dementia according to the standards of pharmacological studies. Reappraisal of the evidence with detailed examination of the protocols can be effective to promote evidence-based practice and to bridge the research-practice gap in non-pharmacological practice including care for people with dementia.

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Research article

Are senior citizens resources? A qualitative inquiry

Samudyuti Ray, Damodar Suar, Susmita Mukhopadhyay

Abstract

Background: Due to lengthy lifespan of the people, population of senior citizens is increasing. The lengthy lifespan of senior citizens associates with varied experiences, skills, and knowledge. **Aims:** This study explores whether senior citizens are resources and why they are resources. **Methods:** A qualitative study was carried out using interviews and observations. Forty-three senior citizens were selected using a snowball sampling technique from Kolkata and nearby areas. Additionally, 22 young adults shared their opinions from same locations. Young adults' views were considered to gauge whether those were congruent with the views of senior citizens. **Results:** Senior citizens perceive themselves as resources because they possess (a) positive behavioural traits, (b) intrapersonal and interpersonal abilities, and (c) wellness. The views are consistent with 21 young participants. Such similarity of views in two generations reaffirms the reasons. **Conclusion**: Senior citizens prefer to stay active for long span to become valuable for the family and society. They require support and opportunities from their families and societies to harness their abilities and change adverse perceptions about them.

Key words

Intrapersonal and interpersonal abilities, positive behavioural traits, qualitative analysis, senior citizen, wellness

Introduction

Studies conducted by the United Nations based on census and health related data (2015) indicated that the population of senior citizens is increasing by 55% in Asia and 21% in Europe and other continents.[1] Evidence also suggests that the number of senior citizens in India is increasing. These increases were caused mainly by advancements in science, technology, and medicine that lengthened senior citizens' lifespan.[2] In India, the first study on ageing was conducted from the perspective of *Ayurveda more* than 3000 years ago.[3]

Most studies on senior citizens in India have focused on chronic diseases, socioeconomic security, their care system, and the relevant comprehensive policy and welfare measures.[3,4,5] With increasing population of senior citizens, this study explores whether senior citizens perceive themselves as resources and why do they perceive so? In addition, it seeks to uncover younger adults' perceptions of them. This study explores the aforementioned queries from a human resource perspective, which has been ignored in most of the literature.

Literature Review

Ageing involves different processes with unique physiological, psychological, and social changes.[6] However, ageing becomes adverse only when it harms older people. Despite this, a commonly held perception is that old age diminishes a person's importance. Efforts to break this beliefs include the positive views of 'active ageing', 'successful ageing', and 'healthy ageing', which have entered the ageing lexicon.[7] These positive views encourage senior citizens to become engaged with professional work, participate in civic work, and maintain their physical and mental fitness.[8]

Differences in social, economic, political, and governmental initiatives between developed and developing countries affect the kinds of issues senior citizens face. For example, while social security is available for senior citizens in developed nations, it is not so available to them in developing nations. In 2011, based on the United Nations framework, the Government of India made the National Policy for Senior Citizens, which suggests that there will be no permanent retirement system in the future.[9] The policy, instead, offers an optimistic and accommodative approach to cultivate a society in which people of different generations can live together in harmony. In addition, the policy implemented stringent laws to prevent abuses and violence to senior citizens from their children, extended family members, and society.[10]

India had a rich traditional social system in which older people used to be highly respected in their family and society. Younger people felt fortunate when senior citizens lived with them because they believed that they lived under a protective umbrella. During periods of need and crisis, younger people received economic, emotional, and informational support from older.[11] However, the customs that encouraged multiple generations to live

together are rapidly disappearing from the social system. Individuals, including the older, are going through changes in social relationships, lifestyle, thinking, and outlook. The consequence of these changes is that senior citizens do not receive the same level of care as younger people.[5] At present, they do not receive the respect, care, affection and health-related services that they received previously; and now they live in insecurity.[12]

Before these changes, older people possessed the right to make decisions for the family. They held a central position within the family, but they are now being pushed to the periphery.[13] They face uncomfortable behaviour by the young members of the family, including verbal abuse, disrespect, neglect, and even physical assault.[14] Very few senior citizens disclose the abuses and violence they face regularly.

The abuses can largely be attributed to the emotional and economic dependence of the older people on the family and shifts in the morality, values, and ethos of Indian society.[15] This change represents a significant setback for the older people in the economic, social, and psychological spheres and is contributing to a deteriorating quality of life. Despite these shifts, older people's experiences can be valuable to guide younger people, who are joining the workforce and learning to manage their responsibilities through interaction with senior citizens.[4,16]

Senior citizens face negative stereotypes, abuses, and violences. The contrasts between traditional Indian values and present attitudes and behaviour towards older people are worth considering. Can the older people contribute to their families and society? Though the national policy (2011) proclaims them to be resources, it fails to explain how and why they are resources to their families and society. Hence, a qualitative study was undertaken to explore whether older people have the experiences and abilities to serve as productive resources.

Methods

Participants

In India, every person over the age of 60 is considered to be a senior citizen.[17] Senior citizens were chosen for this study using a snowball sampling technique from Kolkata and nearby areas because they are literally, politically, socially conscious and curious people who prefer to search answer behind the happening of any of the issues. Also, they possesses revolutionary attitude.[18] One participant gave information to the researcher about another senior citizen, and, through that method, 43 senior citizens were contacted and agreed to participate. A participant who gave information about another senior citizen acted as a third party as an introducer and had no impact on direct observation of the researcher. The participants were 60-90 years old (M_{age}= 71.62, *SD*= 7.44), were from middle-class, urban areas, and were predominantly males (8 females, 35 males). They were economically independent and were able to meet the minimum necessities of life from pensions and interests on fixed deposits. Each participant had his or her own house. Their education levels ranged from seven standards to a doctoral degree. Each senior citizen was interviewed and the interview took two hours.

Seven female and five male adults from the same families of the senior citizens were chosen and interviewed. They aged between 27and 35 (M_{age}= 31.91, *SD*= 3.23). Senior citizens of those families gave information about younger adults representing their families. In addition, one female and nine adult males from different families were chosen by using similar technique where one interviewee gave information about other. They aged from 25 to 35 (M_{age}= 29.61, *SD*= 3.24). In both cases, participants represented middle class who were from urban areas of Kolkata and nearby. Their educational levels ranged from graduation to a master's degree. They were knowledgeable, career-oriented, and financially independent. Face-to-face interviews were conducted. For each younger adult, the interview took an hour. The interviews of senior citizens and young adults were conducted in a quiet place to ensure privacy.

Measures

Each senior citizen was asked following questions: (1) 'Give a brief introduction about yourself, and what you have learned from professional and social perspectives?' (2) 'How are you active after reaching the age of 60? Why?' (3) 'Do you agree that you should be viewed as resources? Justify, if you agree or do not agree.'

The young adults were asked similar questions: (1) 'Give a brief introduction about yourself and what you have learnt from professional and social perspectives?' (2) 'According to you what are the things that makes the individual resources?' (3) 'Do you agree that older people should be viewed as resources? Justify, if you agree or do not agree.'

Qualitative methods help to explore the 'how' and 'why' aspects of a phenomenon. In this study, an interpretive case study approach was adopted in order to understand social realities.[19] In addition, open codes, subcategories, and categories from the analysis of narrations and descriptions helped in exploring new conceptualisations.

The techniques used were semi-structured interviews and direct observations. For observation, the researcher spent time in the residences of senior citizens. Permissions were obtained and appointments were made prior to conducting the interviews. The first author conducted the interview in face-to-face manner. Among 43 senior citizens, 20 people and among 22 younger people, eight consented for recording. The interviewees were assured confidentiality of their responses and were later shown the outcome of the study in order to avoid misinterpretation.[19] Each interviewee's responses were listened patiently without breaking rhythms. The senior citizens participated slowly, steadily, and with energy and excitement.

For each senior citizen (adult interviewee), time spent for appointment to take the interview was about one hour (half an hour), during the day of interview was about three hours (one and half hours), and when the research outcome was discussed with the interviewee was about two hours (one hour). For each senior citizen, total time spent was about six hours in three days and for each adult interviewee, total time spent was about three hours in three days. The verbatim of the interview and themes of the direct observation were coded individually by three raters.

Results

Field notes were taken during the interviews. The direct observation was conducted three times: first, when making the appointment in person; second, on the day of the interview; and third, when the interviewees were shown the study's results. Similar types of ideas, words, sentences, and phrases helped to form common themes. By logically grouping similar themes, the researcher created the open codes. The aggregation of similar open codes formed subcategories, and related subcategories formed categories.

This study resulted in 49 open codes from themes, eight subcategories, and three major categories. For validating open codes, subcategories, and categories, three raters were recruited (see Appendix 1). The raters were asked to identify subcategories linking similar open codes of interviews and direct observations. Similarly, specified categories were formed linking subcategories. Inter-rater reliability was estimated by taking open codes upon which the three raters agreed and dividing those by the total number of 'agreed' and 'disagreed'. The inter-rater reliability for the interviews was 0.92; for the direct observation it was 0.94; and the Kappa coefficients for the same were 0.9 and 0.94 respectively which suggested almost perfect agreement among raters. The open codes, subcategories, and categories were shown to the participants, and they agreed on the accuracy of the groupings. Their assent assisted in validating the qualitative study.[20]

The themes that emerged from the interviews and direct observations remained consistent. The approach used for emerging themes was inductive (bottom-up) and deductive (content analysis) for evolving open codes, subcategories, and categories.[21] A word count frequency procedure showed which open codes, subcategories and categories were more common.[22] For viewing senior citizens as resources, participants put emphasis on certain open codes, subcategories, and categories by pronouncing them repeatedly (Table 1).

One respondent mentioned that '*In old age doing work with interest, sincerity gives satisfaction and purpose in life for which disciplined life is needed. Further, flexibility increases adaptability to circumstances after retirement*.' Senior citizens possessed positive behavioural traits. These traits included having aims, discipline, satisfaction, sincerity, ability to adapt, a willing attitude, an amiable personality, and a positive self-concept. Senior citizens were interested to work efficiently with sincerity and willingness. They preferred to have updated information and make adjustments with changes. They were contented with their lives. They were altruistic and good listeners. The senior citizens with positive behavioural traits were active and enjoyed exploring new things.

Another participant mentioned, '*I cannot share knowledge in front of house wife now and that is why covered the self in shell with age. Feel bad*.' This quote indicated that evaluating oneself positively was not appreciated in the society. Senior citizens had reported negative behavioural traits, including pridefulness, respect-seeking, and loneliness. These participants had less interest in becoming engaged with activities. Consequently, they tend to be isolated and depressed.

One participant mentioned, '*After retirement for being resources one must possess independence, knowledge, experiences, skills, contact and communication ability*.' Several senior citizens possessed intrapersonal abilities and were independent, knowledgeable, skilful, and experientially wise. This helped in gaining tacit knowledge and maturity that were useful in solving problems. Senior citizens, having personal contact and communication ability, were acceptable to societal members.

Another participant expressed: '*Older people having better networking ability are good in socialisation*.' This quote suggested that interpersonal abilities were needed in old age. Senior citizens who possessed the social skills of nurturance and empathy, and had the ability to bond with others, had an easier time in making new relationships and managing old ones.

A participant said, '*For being active in old age, a healthy mind, body, soul, engagement in work and security are needed*.' Another participant expressed, *'...we do not get proper support for exploring our hidden capabilities*. Senior citizens wellness can be assured only when they have a healthy lifestyle, which includes good health, community engagement, security, and a supportive environment. Senior citizens garnered support of families and society if they were active, had good health, and financial security.[23]

Open codes emerged from the interpretations of interviews of young adults. These open codes were consistent with those that emerged from interpretations of the interviews and observations of senior citizens. Similar technique was used for emergence of 23 open codes, six subcategories, and three categories (Table 2). There were three raters, recruited for inter-rater reliability (see Appendix 2). Inter-rater reliability for young adults representing same families was 0.91 and other families was 0.88 and the Kappa coefficients were 0.9 and 0.87 respectively which suggested almost perfect agreement among raters.

Table 1: Open Codes, Subcategories and Categories Based on Interviews and Direct Observations		
Open Codes	Subcategories	Categories
1. Interested (67) 2. Satisfied (53) 3. Sincerity (49) 4. Adaptation (32) 5. Willingness (27) 6. Amiable (24) 7. Self-concept (19) 8. Aim (14) 9. Disciplined (14) 10. Updated (11) 11. Listener (9) 12. Optimism (6) 13. Receptivity (5) 14. Luck (4) 15. Techno-savvy (3) 16. Well-dressed (3) 17. Blessed (2) 18. Altruism (2)	Positive behavioural traits (344)	Behavioural traits (383)
19. Respect-seeking (17) 20. Introvert (12) 21. Pride (5) 22. Angry (2) 23. Loneliness (2) 24. Dissatisfied (1)	Negative behavioural traits (39)	
25. Independent (66) 26. Skilled (54) 27. Knowledgeable (38) 28. Experienced (24) 29. Personal contact and communication (24) 30. Goodwill (20) 31. Thinking mind (14) 32. Productive (11) 33. Achievement-oriented (10)	Personal ability (261)	Intrapersonal and Interpersonal ability (329)
34. Networking ability (25) 35. Helping attitude (21) 36. Relational capability (17) 37. Encouragement (5)	Interpersonal ability (68)	
38. Healthy (149) 39. Memorising (24) 40. Mindful (21)	Health (194)	Wellness (470)
41. Engagement in work (81) 42. Continuous learning (55) 43. Enriching Hobbies (22) 44. Loving job (20)	Engagement (178)	
45. Socioeconomic security (61) 46. Unhealthy financially (1) 47. Support (27)	Security (62)	
48. Healthy atmosphere (7) 49. Scope (2)	Environment (36)	
*N*ote. The number in the bracket denotes the frequency of the codes. Subcategories are based on similarity and relatedness of codes, and related subcategories formed categories.		

One young participant mentioned: '*Older people are resources until they are active. For being resources, interest, sincerity, adaptability, discipline, knowledge, experience, communication and networking ability, environment, engagement and security are needed*.' All but one of the young adults perceived senior citizens to be resources because senior citizens had experience and first-hand knowledge about life and acted as a support system when envisaged necessary. The young adults believed that certain positive behavioural traits (e.g., updated, adaptable, sincere, and discipline, interest and a purpose in life) were essential. In addition, they believed that

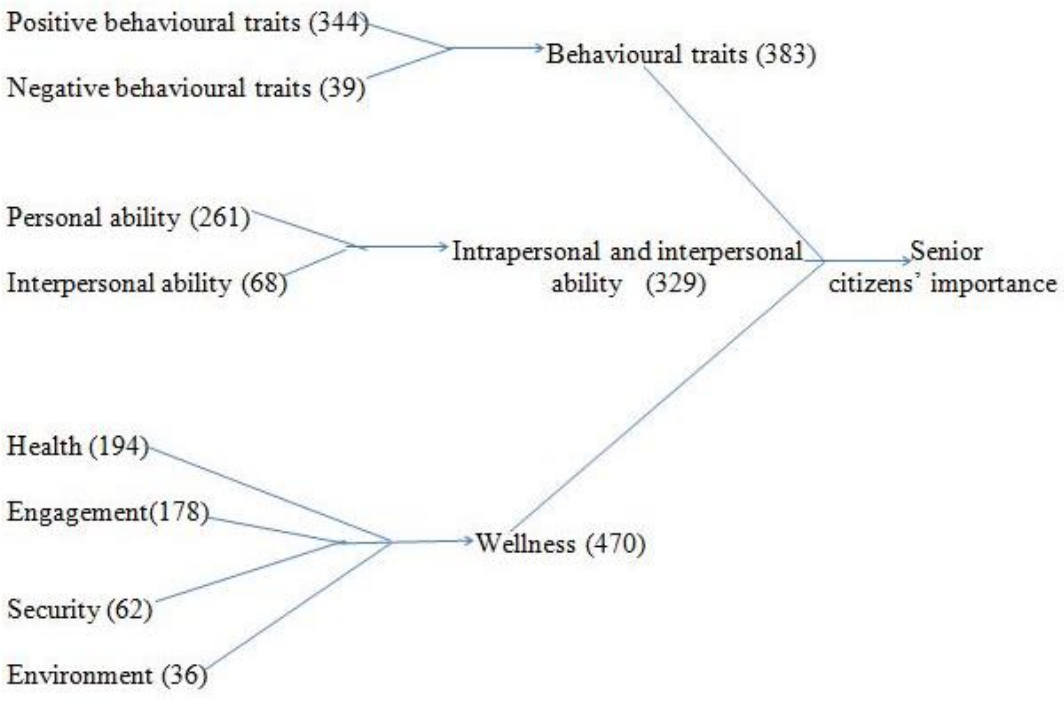
knowledge, experience, personal contact, capacity to communicate, societal members' goodwill, skills, relationships and networking ability were similarly essential. Finally, they believed that senior citizens needed supportive environments, security, and engagement in varied activities.

Table 2. Open Codes, Subcategories and Categories on Views of Younger Generation

Open Codes	Subcategories	Categories
1. Updated (20) 2. Adapted (19) 3. Willingness (16) 4. Interested (15) 5. Sincerity (13) 6. Disciplined (12) 7. Techno-savvy (4) 8. Self-concept (3) 9. Amiable (2) 10. Aim (1)	Positive behavioural traits (105)	Behavioural traits (105)
11. Knowledgeable (20) 12. Experienced (18) 13. Personal contact and communication (15) 14. Goodwill (8) 15. Skilled (8) 16. Thinking mind (4) 17. Independent (4)	Personal abilities (77)	Intrapersonal and interpersonal abilities (94)
18. Relational capability (11) 19. Networking ability (5) 20. Helping attitude (1)	Interpersonal abilities (17)	
21. Support (18)	Environment (18)	Wellness (41)
22. Socioeconomic security (12)	Security (12)	
23. Continuous learning (11)	Engagement (11)	

*N*ote. The number in the bracket denotes the frequency of the codes. Subcategories are based on similarity and relatedness of codes, and related subcategories formed categories.

Figure 1: Diagrammatic representation of the subcategories, categories and main category



This study suggests that positive behavioural traits, intrapersonal and interpersonal abilities, along with wellness helped senior citizen to be seen as resources. The three categories that emerged from this study consist of different constituents (Figure 1).

Figure1 presents the subcategories and categories that emerged from this study. The number within the brackets denotes the frequency of the subcategories and categories. Behavioural traits include both positive and negative behavioural traits. Intrapersonal and interpersonal abilities denote personal qualities, and networking abilities. Wellness includes engagement, health, security, and environment. All of these made senior citizens valuable resources.

Discussion

This qualitative study justifies why and how senior citizens are resources. They believe that they have the ability to contribute, both professionally and socially.[24]

In old age, behavioural traits play an important role in senior citizens' activities. For instance, interest makes them curious to explore new things sincerely and willingly. Senior citizens who work with interest are likely to have aims, self-confidence, and are satisfied, and disciplined. Discipline motivates senior citizens to work with morality and ethicality. The senior citizens who are prideful or who constantly seek respect tend to be more isolated and depressed. Senior citizens who possessed such qualities were frequently ignored by the family and society.

In addition, the senior citizens who possess intrapersonal and interpersonal abilities are resources because they are independent, knowledgeable, have maintained personal contact and communication, and are capable of networking. Maturity and experience help in the development of crystallised intelligence.[25] Crystallised intelligence incorporates cross-cultural sensitivity and social skills, including empathy. Senior citizens who maintain contact and communication, who have the ability to network, and who are able to make and maintain relationships are able to acquire goodwill of societal members over time. In addition, senior citizens need to be well physically and mentally in order to be active.[26] In old age, good health is the primary requirement to remain active.

Further, the study shows that younger adults also perceive older people as resources if they are active. During times of need, they view senior citizens as saviours. Their knowledge and experience act as guiding forces, and their mentoring inculcates values. Their goodwill helps the young adults to establish their identities and gain advantage.

This study explores the reasons how and why senior citizens perceived them as valuable human resources. Findings suggest that possession of positive behavioural traits, intrapersonal and interpersonal skills, and wellness make them valuable human resources, despite the negative stereotypes.

Limitations

This study used participants chosen from the Indian middle class who believe in continuous education for the prosperity and career advancement. In this case, participants were chosen from Kolkata and nearby areas who were salaried people and run family based on pension and interests accrued on their fixed deposits after retirement. Senior citizens of this area prefer to get attached with the local community and indulge themselves in intellectual exchanges of thought through conversation and socialisation. Caution must be expressed in generalising the findings to non-salaried senior citizens and senior citizens in rural areas. The initial qualitative findings need empirical verification in a large sample. Moreover, the participants of both senior citizens and young adults did not include an equal representation of men and women. In accordance with gender roles,[27] women manifest more expressive behaviour in terms of feelings, emotions, cooperation, caring, interpersonal sensitivity, and welfare of others than men; men manifest more instrumental behaviour such as self-reliance, achievement, competitiveness as well as compliance with rules, regulations, and justice than women. Irrespective of gender roles, men and women in professional jobs mould their roles as per the job and organisational demands. On this basis, though there is a possibility that the findings will be same with equal representation of men and women in the sample, it calls for further verification.

Conclusion and Implications

Life expectancy of individuals is lengthening which is resulting in increased population of senior citizens. Reason for it is the advancement in science, technology, medicine along with consciousness and awareness of older people about health issues for being active. Earlier they were precious to family which is gradually diminishing in Indian social system. Globalisation, westernisation is transforming the rich Indian traditional social system which is impacting on senior citizens social relationships, lifestyle, outlook and thinking. Senior citizens now prefer to stay active for a longer time so that they can be independent and valuable to the family and society.

Senior citizens are presently breaking societal barriers and are serving active roles in professional and social settings without assistance. This study explores the components necessary for senior citizens to be perceived as valuable human resources. The components are: (1) positive behavioural traits, (2) intrapersonal and interpersonal abilities, and (3) wellness. Positive behavioural traits make senior citizens active and engaged. These traits include interest, sincerity towards work, willingness, discipline, adaptive, and informative. Senior citizens possessing knowledge, experience, skills, communication and networking capability earn respect in society. Their wellness resides in good health, continuous engagement in some activities, financial security, and supportive environment. Indeed, their knowledge, communication skills, networking capabilities, visions, values, and morals can be taught to younger generations through interaction.

Young adults also feel that there is something to learn from senior citizens till they are active. Thus, they are valuable national treasures.

Formal opportunities can help senior citizens to harness their abilities and can help in changing the views of societal members about senior citizens. Societal members can cultivate positive attitudes towards the senior citizens that can improve the dealing with them and the quality of life of senior citizens.

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Appendix 1 Inter-rater reliability of open codes for senior citizens

Reliability based on interpretation of interviews		**Reliability based on direct observations**	
Agreed	Disagreed	Agreed	Disagreed
1. Interest 2. Satisfied (yes/no) 3. Sincerity 4. Adaptation 5. Willingness 6. Amiable 7. Self-concept 8. Aim 9. Disciplined 10. Listener 11. Optimism 12. Receptivity 13. Luck 14. Techno-savvy 15. Well-dressed 16. Blessed 17. Altruism 18. Respect-seeking 19. Introvert 20. Pride 21. Angry 22. Loneliness 23. Independent 24. Skilled 25. Knowledgeable 26. Personal contact and communication 27. Goodwill 28. Thinking mind 29. Updated 30. Productive 31. Achievement-oriented 32. Networking ability 33. Helping attitude 34. Relational capability 35. Encouragement 36. Healthy 37. Memorising 38. Mindful 39. Engagement in work 40. Continuous learning 41. Enriching hobbies 42. Loving job 43. Socioeconomic security 44. Support 45. Healthy atmosphere 46. Scope	1. Behaviour hurts 2. Reluctant to share thoughts 3. Enthusiastic (interest) 4. Earning (security)	1. Interest 2. Satisfied (yes/no) 3. Sincerity 4.Adaptation 5. Willingness 6. Amiable 7. Self-concept 8. Aim 9. Disciplined 10. Listener 11. Optimism 12. Receptivity 13. Luck 14. Techno-savvy 15. Well-dressed 16. Blessed 17. Altruism 18. Respect-seeking 19. Introvert 20. Pride 21. Angry 22. Loneliness 23. Independent 24. Skilled 25. Knowledgeable 26. Personal contact and communication 27. Experienced 28. Thinking mind 29. Updated 30. Productive 31. Achievement-oriented 32. Networking ability 33. Helping attitude 34. Relational capability 35. Encouragement 36. Healthy 37. Memorising 38. Mindful 39. Engagement in work 40. Continuous learning 41. Enriching hobbies 42. Loving job 43. Socioeconomic security 44. Financially unhealthy 45. Support 46. Healthy atmosphere	1. Reluctant to share thoughts 2. Past disturbance 3. Slow understanding (slow learning)

Appendix 2. Inter-rater reliability of open codes for young adults			
Reliability based on interpretation of interviews of adults representing same family		**Reliability based on interpretation of interviews of adults representing other family**	
Agreed	**Disagreed**	**Agreed**	**Disagreed**
1. Updated 2. Adapted 3. Willingness 4. Interested 5. Sincerity 6. Disciplined 7. Techno-savvy 8. Self-concept 9. Amiable 10. Knowledgeable 11. Experienced 12. Personal contact and communication 13. Goodwill 14. Skilled 15. Thinking mind 16. Independent 19. Support 20. Socioeconomic security 21. Continuous learning	1. Income 2. Friendly	1. Updated 2. Adapted 3. Willingness 4. Interested 5. Sincerity 6. Disciplined 7. Techno-savvy 8. Self-concept 9. Aim 10. Knowledgeable 11. Experienced 12. Personal contact and communication 13. Goodwill 14. Skilled 15. Thinking mind 16. Independent 19. Helping attitude 20. Support 21. Socioeconomic security 22. Continuous learning	1. Information 2. Financial support 3. Education

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Review

Social impact of ageing in people with intellectual disabilities

Kingumbu Kasanzi, Safyan Tariq

Abstract

Introduction: People with intellectual disabilities have a longer life expectancy than ever before, which is resulting in an increase in population of the elderly in this group. There is scant information about ageing related issues in this population especial the psychosocial aspects. **Aims:** The objectives of the review is to highlight the social impact related to ageing in the growing population of the individuals with intellectual disabilities in different areas and cultures and to suggest ways of addressing any difficulties. **Methods:** Relevant articles were searched from electronic databases. **Results:** There is a lack of appropriate studies to compare the care and health status for the elderly with learning disabilities in developed and developing countries. In different parts of the world those growing old with learning disabilities are managed in different ways; some are placed in specialist care homes while others are cared for by their families. There is inadequate support for this population which is leading to social isolation and marginalization and this is a major concern. **Conclusion:** Appropriate emphasis for the needs of the growing ageing intellectual disability population is required. Culturally appropriate actions to deal with social isolation and to develop facilities for elderly with learning disability are to be explored and put into place. There is a need to expand support for family and community care givers. Developing and improving the strategies that would address the needs will need a multidisciplinary effort.

Key words

Ageing, elderly, intellectual disability, learning disability, life expectancy, social service

Introduction

As more people with intellectual disability are living longer,[1] different professionals, families, carers and persons with intellectual disability are becoming increasingly aware about the factors that influence their ageing process and experience. While medical and social advances have contributed to the increased longevity, some people with intellectual disability still struggle to access secure social and health services. National and international studies have shown both similarities and differences in the demography of people with intellectual disabilities, as well as their social support.

The focus of this review is to look at the social impact of the longevity of this population and what these demographic changes may mean to the population. Relevant articles were searched from electronic databases for the purposes of this review.

Prevalence

It has been difficult to find an exact prevalence figure for intellectual disabilities in the elderly population as most of studies focus on children and adults. The studies also fail to differentiate between younger adults and older adults. Whilst population data from most developing regions are less available in comparison with developed countries, there is an increased incidence of intellectual disability and greater life expectancy leading to a growing population of older people with intellectual disability.[2]

Life expectancy in learning disability

There is evidence of an increase in the life expectancy of both people with intellectual disabilities and the general population, but the increase in life expectancy in those with intellectual disabilities is not as significant as that of the general population due to health inequality.[3,4] Looking at the intellectual disability population, there is difference of life expectancy in their subgroups as some are more affected than others with shorter life expectancy and higher mortality rate such as people with Down syndrome, more severe disabilities, people with epilepsy and other genetic cause of intellectual disability.[3]

The country of living or the socio-economic factor can also determine life expectancy. For examples, the life expectancy of Nepali with learning disability is lower than the 54.5 years of the Nepal's general population, which are clearly less than that in the developed nations;[5] whilst age-specific mortality rates are similar between the mild learning disability population and adults within the general population in developed countries including Austria, Germany, Switzerland, Denmark, France, Netherlands, Ireland, the United Kingdom, the United States and Australia.[2] Different factors contribute to the increase in life expectancy for people with learning disabilities such as more person-centred approaches to support, in addition to care and progress in science and technology.[6]

Ageing related issues in learning disability and implication for practice

National Health Service (NHS) in Scotland have considered physical ill-health as a common factor impacting ageing more negatively in older persons with intellectual disabilities, because their health needs are higher than age-defined comparison groups without intellectual disabilities.[6] In addition, Turner and Ueki state that there is limited choice, access, resources and specialist care for ageing people with intellectual disability; these factors lead to their social isolation and loneliness.[7]

World Health Organisation (WHO) has recognized the variations between countries of the world in ageing in learning disability. They have highlighted social concerns for ageing persons with learning disability all over the world but mainly in developing countries. Those with severe and profound impairments are disregarded or institutionalized; and the mildly impaired elderly individuals with intellectual disability are marginalised and they lack the minimal support needed to be productive members of their societies. There is inadequate housing and neglected health care provision in general for this population. There are also concerns about the lack of rehabilitative services and vocational opportunities in developing countries.[8]

In a study on elderly people with learning disability in Chesterfield, UK, Ward considered social factors as a positive element in ageing for elderly and advocated for intellectual disability providers to support people in their services to age well and to plan for the ageing process by engaging those in the community with their families.[9] It is necessary to support elderly to be in touch with their social roots or families. It is suggested that care service providers should look into the social needs of ageing people with intellectual disability.

Learning disability in developed regions and related issues

There are reported differences in the care of ageing individuals with learning disability in developed countries. In the UK, there has been transformation of care from institutionalization to personalization, but living in the community has left elderly people with intellectual disability with limited opportunities according to Walker and Ward.[10] In England, 40% of ageing individuals with intellectual disability live with a parent over the age of 60 and 33% with a parent over the age of 70.[11] This shows the burden of care of people with learning disability on their families.

In contrast, people with intellectual disability in Sweden live in group homes, based on the legislation contained in the Swedish Disability Act. There is high risk of inequality of access in big cities due to insufficient number of group homes.

In the Netherlands, as of 2002, there were 106 centres accommodating people with intellectual disability, with a large proportion in residential centres compared to other European countries.[12] In Ireland, 25.6% of people with intellectual disability live in residential homes.[13] The Irish study highlighted the differences between family, independent, supervised and hospital residence as factors affecting life-span; with hospital residence and supervised residence causing longest life-span in those with profound to moderate learning disability. Family residence was associated with shorter life expectancy but there was no difference in life expectancy between supervised and hospital residence for mild intellectual disability. For most residential care placements, individuals have limited benefit; the choice of the placement often depends on the funding panels or commissioners and disregards the service user wishes. Such type of care placements is less person-centred.

According to Kuo-Yu, 72% (of 0.45 million) of Japanese people with intellectual disability live at home versus 93% of the Taiwanese intellectual disability population.[14] There is no exact statistics but most of the Chinese intellectual disability population lives at home with families. The concept of ageing in learning disability is new for most South East Asian developed and developing countries. Their culture embodies care provision for elderly individuals mostly within the families and the services might not be person-centred.

Learning disability in developing regions and related issues

There is little available data on morbidity and mortality patterns in persons with learning disability in developing countries; as most publications are from developed countries.[15]

In most developing countries, there is no prominent trend towards a gradual ageing of the society, therefore there is no social development planning yet. The family is the main source of support and act as the main caregivers. For example in Nepal families try to help with social integration, organising family parties and cultural festivities; although these activities involve less independence for the elderly with intellectual disability. In addition, participation in these activities is decreased in old age as well as with severity of the learning disability.[5] The family home is expected to be the only residence for the elderly with a learning disability, and members are expected to care for their siblings, as there are no alternative residential or other services. Family members are the most consistent source of support for ageing people with learning disability in Nepal.[5]

Clearly, developing countries have limited social choices and options in provision of services for ageing people with learning disability. They face poverty and most of their needs might not be met due to a lack of support structure and resources. It is not unusual to see that many elderly with intellectual disabilities are isolated in these countries. Understandably, there is a higher burden of care on the family.

Unmet social support needs

To address the needs of older persons with intellectual disability strategically, United Nations Principles for Older Persons fall into five clusters: independence, participation, care, self-fulfillment and dignity.[2] The challenges posed by ageing people with learning disabilities are compounded by the health and social care service requirements. The responsibility of the social services to manage social circumstances of later life by establishing links with other services to meet the individual needs is paramount. With increasing age, there is a convergence in terms of health and social care needs between those with and without disability. Elderly people with learning disability should benefit from the same equal opportunities and good quality social provision as their peers without a learning disability.[2]

Deinstitutionalisation or living within the community has offered a better quality of life for most people with learning disability, but older people with learning disabilities have encountered the same discrimination experienced by older people in general in term of decreased social opportunities.[10]

In most developing countries, the absence of family support makes individuals with learning disabilities abandoned to fend for themselves or left to poorly organised and inadequate services.[8] As most people with learning disabilities do not marry or have children, they are less likely to have family supports in old age than the elderly in the general population.[16]

Discussion

Mortality rates are higher for people with learning disabilities and certain groups such as those with Downs Syndrome or severe learning disabilities are affected to a greater degree.[3] Data for those with learning disabilities from developing countries is quite limited; most publications are from developed countries.[15] Supervised environments are associated with increased life-span in those with moderate to profound learning disabilities.[13]

As parents of ageing individuals with learning disability become frail, they start mutual caring between the individual with learning disability and the frail or dying parent and most isolate themselves as a result.[11] The burden of care can therefore cause social isolation. Sometimes other relatives step in to help fully or partially, depending on their own abilities.

In Asian and African countries, there is a preference for care in the home environment with support from family members.[14,17] European countries have a mixed picture for care of the elderly with learning disabilities, some countries like the Netherlands and Switzerland show preference for group homes and residential centres; whereas in countries such as UK and Ireland most of the elderly with learning disabilities are supported at home.[12,13,15,18]

Conclusions

There are many similarities and differences in life expectancy and the social life of ageing individuals with learning disabilities compared with elderly in general population. The changing longevity of the individuals with intellectually disability causes strain to existing services for them and to their families and to carers. It also impacts on their own life when their needs are not met. Making the old age a happy, healthy and fulfilling one is a definite challenge in learning disability population. However, it is possible to give individuals choice and control in their lives with respect to their cultures.

There are differences in social support for ageing people with learning disability, based on location, culture and socio-economic status. There is a need for services to support older people with learning disabilities in maintaining friendships and meaningful activities. A multidisciplinary approach is needed involving physicians/geriatricians, psychiatrists, social services, families and carers as well as the elderly with learning disabilities to identify and meet their individual needs, address their social issues and provide necessary care.

Throughout the world, families remain the principal resource of informal support for ageing individuals with intellectual disabilities. Parents and family members supporting or taking care of an ageing person with learning disabilities would benefit from increased social support to maintain their independence; and they should be provided with a safety-net whenever needed. Support from government and voluntary organisations would be valuable in this regard.

Developed countries can adjust their policies and aim at achieving personal goals and aspirations of elderly with intellectual disabilities. In many developing countries with underdeveloped or non-existent social support system for this population, governments need to take greater responsibility through viable policies and appropriate funding.

Partnership with national and international non-governmental organizations may be helpful to develop person-centred services according to individual needs, in collaboration with the local authorities, elderly themselves and their families. Social care and support should be prioritized for this population and that is a felt need throughout the world. Relevant training for professionals and public education in developing countries are crucial to increase awareness about these issues.

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Insight

Review of Plot 29 by Allan Jenkins

Teresa Black

Last Saturday I was at the RHS Tatton Flower Show which I have been to several times. I like to go as I was brought up near there and Tatton Park was our staple weekend outing especially at rhododendron time. But it seems to me that by degrees the gardens are being squeezed out by the shopping opportunities. It would be very easy to spend a great deal of money there, I was lucky to escape with a few packets of seeds and some flavoured oil. The experience described in *Plot 29* is at the other end of the gardening spectrum.[1] The author and his brother were fostered as children by a couple who later 'sent them back' as being too difficult. The childhood story is fragmented and much of the trauma is hinted at via dreams and half memories. Things become if anything more complicated when Jenkins takes the decision to access his care records from Barnado's and various children's homes in Plymouth. Throughout there is a thread of Allan feeling intensely protective of his older but frailer brother Christopher who appears to have been even more traumatised by his childhood, which was partly with his brother and partly not. The account moves between the present, where Allan is helping renovate an overgrown allotment plot (the 29 of the title) and flashbacks to childhood as well as extracts from the records. What takes the author by surprise is how if anything accessing his records provides more questions than answers and reduces him to a tearful wreck, when he has to pull himself together to attend an editorial meeting in his role as *Observer* journalist.

The work on the plot and the encounters and camaraderie between the allotment holders is described in rich detail. For example, Jenkins and another allotment holder are clearing an overblown plot in August. He describes the process thus; '*everything seeded is lifted except wild rocket and amaranth, too magnificent to mess with: more than a metre tall, episcopal red leaves like cloth wrapping a sacrament.*' At this point I have to rush to my vegetable patch and look at my red orach which is in the amaranth family; about two metres tall I would say, I should have cut it back but couldn't bear to.

Jenkins also describes another plot which is in Denmark; his wife is Danish and it belongs to her family. They only visit this plot 3 or 4 times a year but it emerges as a place of healing, perhaps because although he doesn't say much about his wife it is clear that they have a strong and happy marriage. It sounds an idyllic spot abounding with wildlife and the prose is lyrical; '*time drifts like smoke from the stove*.' I want to go there. The book ends with a family barbecue in London on a glorious summer afternoon. The analysis in the book is not heavyweight but I think is all the more telling for that; it would have been tempting to detail exorcising the childhood ghosts in a long therapy but although he does have therapy it is clear that it is a difficult and painful process and definitely does not make all neat and tidy. Although he does talk about working on the plot and interacting with the other plot holders as being part of the healing process, he does not offer it as a solution for others. It is much more like real messy experience than that. Both patients and mental health professionals would gain a lot from reading this book.

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Review article

Galantamine-memantine combination superior to donepezil-memantine combination in Alzheimer's disease: critical dissection with an emphasis on kynurenic acid and mismatch negativity

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Abstract

Background: The donepezil-memantine combination is a US Food and Drug Administration (FDA)–approved medication to treat Alzheimer's disease (AD). Galantamine is superior to donepezil because it is a positive allosteric modulator of the alpha-7 nicotinic acetylcholine receptor (α7nAChR). Although galantamine and memantine are both FDA approved for the treatment of AD, the combination is still underutilized in clinical practice. **Aim:** The objective of this review was to critically examine the mechanisms by which the galantamine-memantine combination may be superior to the donepezil-memantine combination in AD by targeting the cholinergic-nicotinic and glutamatergic systems concurrently. **Method:** PubMed and Google Scholar were searched using the keywords Alzheimer's disease, cholinergic, glutamatergic, α7nAChR, *N*-methyl-D-aspartate (NMDA) receptors, donepezil, galantamine, memantine, clinical trials, and biomarkers. **Results:** AD is associated with several biomarkers such as kynurenine pathway (KP) metabolites, mismatch negativity (MMN), brain-derived neurotrophic factor (BDNF), and oxidative stress. In several preclinical studies, cognitive impairments significantly improved with the galantamine-memantine combination compared to either medication alone. Synergistic benefits were also seen with the combination. In a randomized controlled trial (RCT) in prodrome AD, cognition significantly improved with the galantamine-memantine combination compared to galantamine alone; cognition declined after galantamine was discontinued. However, in an RCT in AD, cognition did not significantly improve with the galantamine-memantine combination compared to galantamine alone. In a retrospective study in AD, the galantamine-memantine combination significantly improved cognition compared to the donepezil-memantine combination. Galantamine and memantine via the α7nACh and NMDA receptors can counteract the effects of kynurenic acid and enhance MMN and BDNF. **Conclusion:** Future studies with the galantamine-memantine combination with KP metabolites, MMN, and BDNF as biomarkers are warranted. Positive RCTs in AD may lead to FDA approval of the combination, resulting in greater utilization in clinical practice. In the meantime, clinicians may continue to use the galantamine-memantine combination to treat patients with AD.

Key words

Alzheimer's disease, kynurenine pathway, galantamine, memantine, brain-derived neurotrophic factor, mismatch negativity, oxidative stress

Introduction

Currently, acetylcholinesterase inhibitors (AChEIs), such as galantamine, rivastigmine, and donepezil,[1] the *N*-methyl-D-aspartate (NMDA) receptor antagonist memantine,[2] and the donepezil-memantine combination are the only US Food and Drug Administration (FDA)–approved drugs for the treatment of Alzheimer's disease (AD). Research in the development of new therapeutic interventions is promising. However, the current treatment paradigm remains unchanged: AChEI monotherapy (donepezil, galantamine, or rivastigmine) in the earlier stages of AD[1] and memantine[2] in the moderate or severe stages. The galantamine-memantine combination targets α-7 nicotinic acetylcholine receptors (α7nAChR) and NMDA receptors concurrently, leading to a synergistic effect.

The aim of this review was to critically examine the mechanisms by which the galantamine-memantine combination may be superior to the donepezil-memantine combination in AD by targeting cholinergic and glutamatergic systems and counteracting the effects of kynurenic acid (KYNA). PubMed and Google Scholar were searched using the keywords *Alzheimer's disease*, *cholinergic*, *glutamatergic*, *nicotinic receptors*, *NMDA receptors*, *donepezil*, *rivastigmine*, *galantamine*, *memantine*, *clinical trials*, and *biomarkers*. Relevant preclinical and clinical evidence is discussed in the article.

Neurotransmitter systems in Alzheimer's disease

Dysregulation of multiple neurotransmitters complicates the understanding of control and modulation of neuronal activities in AD. Currently, cholinergic and glutamatergic systems are the most-studied neurotransmitters in AD.[3,4]

Role of the cholinergic-nicotinic system

The cholinergic pathway in the brain has been shown to be involved in information processing and online holding of information, facilitating the switch from online attentive process to off-line memory consolidation and preventing interference from previously stored memories. Decline in central nervous system (CNS) cholinergic function contributes to cognitive decline associated with AD.[3,5] Patients with advanced AD have severe loss of cholinergic cells in the nucleus basalis that affects the cerebral cortex, especially the temporal lobe wherein cholinergic axon loss can be up to 80%.[6] Cholinergic depletion may increase the production of β-amyloid and increase its neurotoxicity, including acetylcholine synthesis and signal transduction of cholinergic transmission.[6] Cholinergic depletion may also lead to tau phosphorylation, which is important in the formation of neurofibrillary tangles in AD.

In a 24-week study of patients with AD treated with galantamine who did not respond to previous treatment with donepezil, apathy, irritability, aberrant motor symptoms, and executive function improved significantly.[7] In another study of 89 patients with AD, 86 had significant improvement in cognitive scores when they were switched from donepezil to galantamine.[8]

In 28 healthy subjects, mecamylamine (a selective non-competitive nAChR antagonist) administration induced widespread electroencephalogram (EEG) changes, affecting both the spectral content and temporal dynamics of neuronal oscillations; these EEG changes were reversed by galantamine.[9] In another study with 33 healthy participants, a single oral dose of mecamylamine 30 mg induced significant cognitive impairments and produced a decrease in posterior α and β power in the EEG. These effects were partially reversed by the coadministration of galantamine.[10] Finally, in 42 healthy participants, a decrease in beta oscillations rebound was seen with galantamine compared to placebo.[11]

Role of the glutamatergic system

Glutamatergic receptors are more prominent in the cortex and hippocampus, which are important for developmental synaptic plasticity, long-term potentiation (LTP), memory formation, and learning.[12] Glutamate stimulates metabotropic and ionotropic membrane–based receptors. There are three types of ionotropic receptors: NMDA, α-amino-3-hydroxy-5-methyl-4-isoxazol-propionate (AMPA), and kainate. NMDA receptors allow the influx of Na+ and Ca+ ions,[13] which serve as the gating switch for synaptic plasticity modification and play an important role in learning and consolidation of short-term memory into long-term memory.[14] The synaptic stimulation via NMDA receptors plays an important role in learning and memory. However, overstimulation of NMDA, AMPA, and kainate receptors by excess glutamate can cause excitotoxicity, which, in turn, can damage or kill the neurons and cause neurodegeneration.[15] Therefore, glutamate stimulation with no excitotoxicity is required for the optimal treatment of AD.

Persistent activation of CNS NMDA receptors by the excitatory amino acid glutamate has been hypothesized to contribute to the symptomatology of AD (package insert). Memantine is postulated to exert a therapeutic effect through its action as a low to moderate affinity noncompetitive (open-channel) NMDA receptor antagonist that binds preferentially to the NMDA receptor–operated cation channels (package insert). There is no evidence that memantine prevents or slows neurodegeneration in patients with AD (package insert). Unfortunately, definitive data on glutamatergic transmission involvement in AD are still incomplete.[16]

Advantages of combining galantamine and memantine

Memantine is a noncompetitive antagonist with low to moderate affinity for NMDA receptors.[17,18] Instead of binding to the agonist site, memantine blocks the open channels and prevents the activation of NMDA receptors. Memantine inhibits the NMDA receptors in a voltage-dependent manner, which enhances the signal-to-noise ratio of the cortical neuron and reduces the excitotoxicity caused by excess glutamate release.[18,19] On the other hand, galantamine increases glutamate release.[20] Thus, at first glance, the two drugs appear to act in an opposing manner. However, a closer examination of the effects of both medications on the cholinergic and glutamatergic systems reveals that these medications may work synergistically to provide a more normal neurophysiological response and improve cognitive impairments in AD.[21,22] When combined, memantine prevents cell damage due to electrophysiological noise, whereas galantamine increases synaptic activities and long-term potential. Galantamine improves cholinergic response by two different mechanisms of action: it causes allosteric modulation of α7nAChR that increases its sensitivity to acetylcholine and reduces the loss of neurodegeneration-induced cholinergic stimulation. Unlike donepezil and rivastigmine, which may decrease postsynaptic nicotinic receptor desensitization, galantamine causes modest inhibition of AChEI. Galantamine improves the AMPA-mediated signaling, which could be neuroprotective and may improve memory coding,[21] and potentiates the neuroprotective effect of memantine against NMDA-induced excitotoxicity.[23,24] The use of galantamine and memantine in combination is also supported by pharmacodynamic and pharmacokinetic studies.[21,25,26] Therefore, combined treatment with these two medications would not affect the metabolism of either one. Galantamine is metabolized by cytochrome P450 (CYP) 2D6 and CYP3A4, which are not affected by memantine.[27] Based on this evidence, it was argued that modulation of NMDA and nicotinic receptors by memantine and galantamine may provide an optimal combination therapy for the treatment of AD.[21]

The kynurenine pathway in Alzheimer's disease

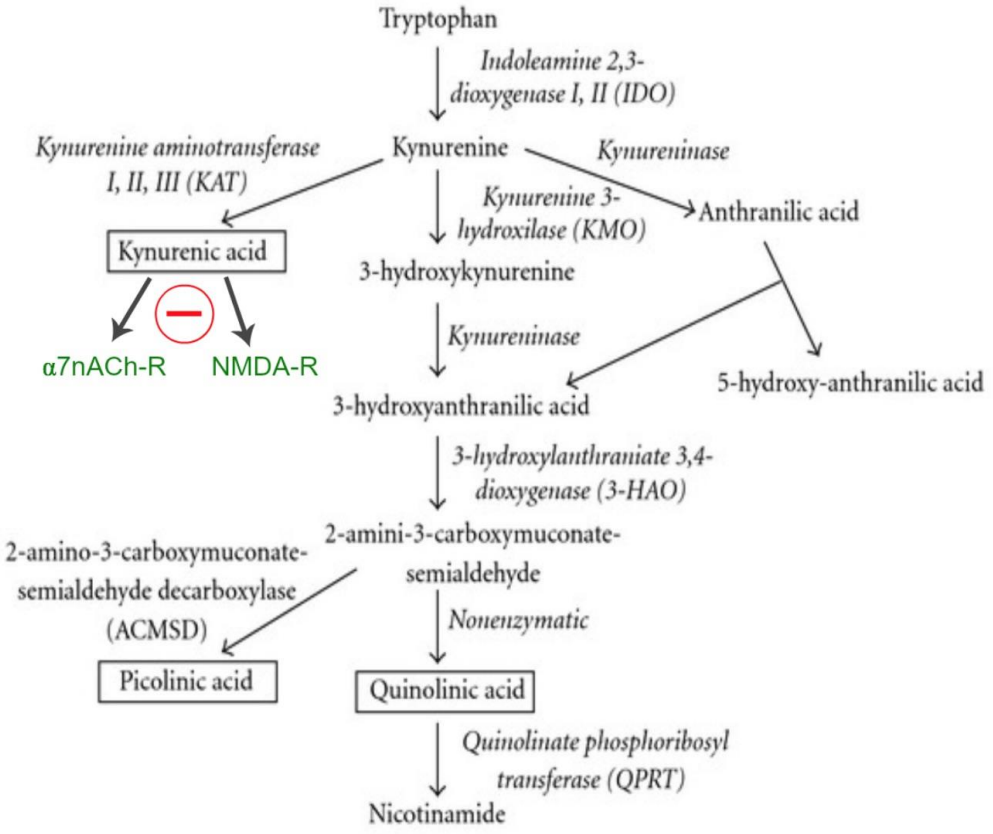
The KP is a major route of tryptophan metabolism. The metabolism of L-tryptophan is a highly regulated physiological process, leading to the generation of several neuroactive compounds within the CNS. These compounds include the aminergic neurotransmitter serotonin (5-hydroxytryptamine, 5-HT); products of the KP of tryptophan metabolism such as KYNA, quinolinic acid (QUIN), 3-hydroxy anthranilic acid (3-HANA), l-kynurenine (KYN), and 3-hydroxy kynurenine (3-HK); the neurohormone melatonin; several neuroactive kynuramine metabolites of melatonin; and the trace amine tryptamine. QUIN has excitatory properties, while KYNA has inhibitory properties.[28] Alterations of KYNA and QUIN are associated with the cognitive impairments in AD.[29] QUIN has neurotoxic properties, whereas KYNA is considered neuroprotective.[30] KYNA is a broad-spectrum nonselective glutamate receptor antagonist and was shown to be neuroprotective in a neurotoxicity rodent model.[31] In KP, tryptophan 2,3-dioxygenase (TDO) and indoleamine 2,3-dioxygenase (IDO) convert tryptophan into N-formyl-L-kynurenine, which is further metabolized to KYN by formamidase (Figure 1). IDO and TDO are rate-limiting enzymes of KYN synthesis. KYN is further metabolized into KYNA and QUIN along distinct pathways within the brain due to their reliance on the respective kynurenine aminotransferase (KAT) and kynurenine 3-hydroxylase enzymes. Astrocytes possess KAT but lack kynurenine 3-hydroxylase, thereby allowing them to participate only in the conversion of KYN to KYNA. Microglias possess kynurenine 3-hydroxylase, allowing them to convert KYN to QUIN. A large body of evidence from animal experiments has also implicated these metabolites in the pathogenesis of chronic neurodegenerative disorders.[32] TDO is highly expressed in the brains of AD mice models and in AD patients, suggesting that TDO-mediated activation of KP could be involved in neurofibrillary tangle formation and is associated with senile plaque.[33] The metabolism of KYNA is also altered in AD. KYNA concentration is increased in the striatum and hippocampus[34] and decreased in the blood[35] and cerebrospinal fluid.[36] In patients with AD, increased tryptophan degradation and simultaneous altered KYN concentration were found in the plasma.[29] Increased brain KYNA concentration was found in 11 postmortem AD subjects compared to 13 healthy controls who had no such increase.[34] The production of QUIN is increased by human macrophages and microglia in AD and may be one of the factors involved in the pathogenesis of neuronal damage in the disease.[37] In addition, the activity of the IDO enzyme involved in the KP is increased in serum, which correlates with neopterin levels and reduced cognitive functions.[38] KYNA blocks α7nAChR non-competitively and can increase the expression of non-α7nAChR.[39,40] Agonism of α7nAChR facilitates learning and memory process in animal models and patients with AD,[41,42] whereas blockade of NMDA-R and α7nAChR by KYNA may be responsible for the cognitive problems in AD. Although glutamate blockade of receptors by KYNA may cause cognitive deficits, same blocking action can be protective against the excitotoxic effect of abnormally high glutamate receptor activations. This protective effect may be enhanced by KYNA, which may lead to increased expression of nerve growth factor (NGF) in glial cells.[43]

Activation of NMDA receptors appears to be important in the establishment of LTP.[44] Overstimulation of these receptors may cause a breakdown of nerve cells likely involved in the pathogenesis of chronic neurodegenerative disorders including AD.[28] KYNA is an endogenous antagonist of NMDA receptors, which is shown to be neuroprotective. The NMDA receptors are widely distributed in the hippocampus and striatum.[45] The hippocampus, pallidum, and striatum were more sensitive to QUIN toxicity compared to the cerebellum, substantia nigra, amygdala, medial septum, and hypothalamus.[46] The pyramidal cells in the hippocampus are more sensitive than other neuronal cell types in the brain,[46] with cholinergic neuronal death in the striatum following QUIN injection.[47] Memantine significantly attenuated QUIN-mediated poly (ADP-ribose) polymerase activation, nicotinamide adenine dinucleotide depletion, and lactate dehydrogenase release in both neurons and astrocytes.[48] Galantamine and memantine can target not only the cholinergic and glutamatergic systems but also KYNA through the α7nACh and NMDA receptors, which are downregulated by increased (decreased in several studies) KYNA concentration in AD. This inhibitory effect of KYNA on these two receptors may be responsible for the cognitive problems in AD in addition to other pathophysiological mechanisms. Galantamine and memantine cross the blood-brain barrier and acting via α7nACh and NMDA receptors may counteract the effects of KYNA.[49-52] Also, kynurenine 3-monooxygenase (Figure 1) inhibition[53] may have effects similar to the galantamine-memantine combination. For all the above-mentioned reasons, the KP may be a valuable target for future therapeutic discovery in the treatment of neurodegenerative diseases.[54]

Preclinical evidence for the AChEI and memantine combination

Several preclinical studies have investigated whether a combination therapy with memantine and an AChEI would provide a more effective treatment for memory impairments than either drug alone. In an amyloid precursor protein transgenic mouse (APP23) model of AD, the donepezil and memantine combination was synergistically more effective in alleviating spatial learning and retrieval impairments than either medication alone.[55] Moreover, co-administration of memantine and galantamine synergistically rescued scopolamine-induced amnesia in mice.[56] Use of the galantamine-memantine combination led to beneficial effects on cognitive performance in aged Rhesus macaques.[57] The efficacy of ARN14140, a memantine-galantamine–based multi-target compound, was assessed in an AD model based on central administration of β-amyloid (25–35) peptide ($A\beta_{25-35}$) to mice. ARN14140 prevented $A\beta_{25-35}$–induced cognitive impairment and alteration of the major markers of neurodegeneration and cell death.[58] Cognitive enhancement was also demonstrated with the

Figure 1: Tryptophan metabolism by the kynurenine pathway



In the kynurenine pathway, tryptophan 2,3-dioxygenase and indoleamine 2,3-dioxygenase convert tryptophan into N-formyl-L-kynurenine, which is further metabolized to L-kynurenine by formamidase. L-kynurenine is metabolized into kynurenic acid (KYNA) and quinolinic acid along distinct pathways within the brain due to their reliance on the respective kynurenine aminotransferase and kynurenine 3-hydroxylase enzymes. KYNA has inhibitory action on α7 nicotinic and NMDA receptors. Galantamine and memantine cross the blood-brain barrier and would target α7 nicotinic and NMDA receptors, thereby counteracting the effects of KYNA.

galantamine-memantine combination in rats; the combination was synergistically better than either medication alone.[59] Interestingly, pro-cognitive effects were blocked by the α7nAChR antagonist methyllycaconitine, suggesting that the observed cognitive enhancement is α7nAChR dependent.[59] Finally, in rats, the memory-enhancing strategy via α7nAChR was apparently less effective when glutamate/NMDA receptor action was directly impaired by MK-801/dizocilpine treatment.[60]

Only one study simultaneously did two experiments on the efficacy of the galantamine-memantine and donepezil–memantine combinations.[61] This study was conducted in older rabbits with delay eyeblink classical conditioning, a form of associative learning that is severely impaired in AD, and demonstrated that administration of memantine with galantamine significantly improved learning compared to vehicle, but the addition of memantine did not improve learning compared to galantamine alone. However, older rabbits treated with donepezil or a combination of memantine and donepezil had no significant improvements in learning compared to rabbits treated with vehicle. This finding suggests that cholinesterase inhibition alone is insufficient to improve learning in this model, and beneficial effects are provided through galantamine's allosteric activation of nAChRs. These data indicate that stimulation of α7nAChRs may underlie the beneficial effects of galantamine. Hence, it can be hypothesized that the efficacy of the galantamine-memantine combination is due to the synergistic action of the α7nACh and NMDA receptors.[59]

Clinical evidence for the AChEI and memantine combination

Several randomized controlled trials (RCTs) of combined therapy with an AChEI and memantine have reported decreased cognitive decline and improved cognition compared to AChEI monotherapy in AD.[62,63] In addition to cognitive improvements, this combination therapy has also been shown to improve functioning and global outcome.[64] In data pooled from four 6-month RCTs, the donepezil-memantine combination (N=838) was significantly better than monotherapy (N=570) in patients with AD.[65] In the clinical effectiveness long-term trajectory study of 383 participants with AD,[66] combined treatment with donepezil and memantine produced significantly lower mean annualized rates of deterioration in the Information-Memory-Concentration subscale of the Blessed Dementia Scale compared to AChEI

Table 1. Characteristics of studies combining galantamine and memantine for cognitive impairments in Alzheimer's disease

Study Design	Study Population	Intervention Dose	Total Patients	Age (years) Mean±SD	Outcome	Limitations
RCT[68] (2 years)	Subjects with amnestic MCI	Galantamine 8 mg BID+memantine 10 mg BID versus galantamine 8 mg BID versus placebo	232 (placebo=79, galantamine=75, galantamine+ memantine=78)	67.4±7.8	Only the subgroup of pre-AD patients treated with medication showed significant benefit Placebo: -4.5/1/0.5* Galantamine: -1.25/1/1.25* Combination: -0.75/2.5/4.75* (ADAS-cog presented as P25/median/P75) P<0.05	Premature termination at maximum treatment duration of 12 months for safety reasons based on the results of an intermediate analysis of safety data of two industry- sponsored trials of galantamine in MCI
RCT[69] (1 year)	Subjects with mild to moderate AD (MMSE score=15-26)	Galantamine 24 mg+memantine 10 mg BID versus galantamine 24 mg+placebo	226 (galantamine=114, combination=112)	72.3±8.2	No difference was seen in ADAS-cog (primary outcome) between the treatment groups (P=0.83) at the end of study; no difference was seen in secondary outcomes (ADCL-ADL: P=0.98, CDR: P=0.30, NPI: P=0.07)	Used subjects with mild-moderate cognitive decline
Retrospective cohort Study[70] (1.5-year follow-up)	Subjects with a diagnosis of AD	All received ChEI (donepezil: 64, galantamine: 59) for 6 months. Then memantine 5–20 mg was added for 12 weeks. The mean daily dose of donepezil was 7±2.5 mg, memantine was 16.7±5.2 mg, and galantamine was 17.8±4.6 mg	123 (9 patients dropped out due to side effects)	78.9±7.1	ChEI reduced the MMSE score by -1.7, HDS-R score by -1.8, FAB score by -0.8 (P<0.05). After the addition of memantine, galantamine+memantine showed significantly better preservation of cognitive function compared to donepezil + memantine in MMSE score at 3 months (21 vs 14, P<0.05), HDS-R at 12 months (11 vs 9, P<0.05), and FAB at 3 months (15 vs 9, P<0.05). Donepezil+memantine showed better preservation of affective functions in AS at 12 months (P<0.05) and ABS at 6 months (P<0.05)	Retrospective study, selection bias, did not use the commonly used standard scales for measuring cognitive function like other international studies, and number of subjects tested for a few scales were low

*P25 is 25th percentile and P75 is 75th percentile. ABS: Abe's behavioral and psychological symptoms of dementia, AD: Alzheimer's disease, ADAS-cog: Alzheimer's Disease Assessment Scale-cognitive, ADCS-ADL: Alzheimer Disease Cooperative Study-Activities of Daily Living, AS: Apathy Scale, CDR: Clinical Dementia Rating, ChEI: cholinesterase inhibitor, FAB: Frontal Assessment Battery, HDS-R: Hasegawa Dementia Rating Scale-Revised, MCI: mild cognitive impairment, MMSE: Mini-Mental State Examination, NPI: Neuropsychological Inventory, RCT: randomized controlled trial.

Table 2. Advantages of galantamine-memantine combination	
Galantamine + Memantine	Synergism of cholinergic and glutamatergic systems
	Synergism of α7nACh and NMDA receptors
	Counteract the effects of kynurenic acid
	Enhance mismatch negativity
	Enhance brain-derived neurotrophic factor
	Double-Hit Antioxidant Treatment

monotherapy (P<0.001, Cohen's *d*=0.10–0.34). In 2014, the combination of donepezil and memantine (Namzaric as one pill) was approved by the FDA for the treatment of AD. Galantamine is an AChEI that has a postulated dual mode of action as a nicotinic receptor modulator unlike other AChEIs. Therefore, the combination of galantamine and memantine may be superior to the donepezil-memantine combination.

Clinical evidence for the galantamine-memantine combination

In a 53-year-old woman with AD, a combination of donepezil-memantine was ineffective. With the galantamine-memantine combination, irritability and violence gradually decreased and disappeared.[67] To date, three studies comparing the galantamine-memantine combination to monotherapy/placebo or donepezil-memantine in cognitive disorders have been conducted.[68-70] The total sample size in the three studies included in this review was 581, with a mean ± SD age of 72.9 ± 7.7 years. A detailed description of the three studies is provided in Table 1. Two studies were RCTs,[68-69] while one was a retrospective cohort study.[70]

In a 2-year RCT with 232 subjects with mild cognitive impairment (MCI), a combination of galantamine and memantine (compared to galantamine alone or placebo) showed significant improvement in the Alzheimer's Disease Assessment Scale cognitive subscale score (ADAS-cog) in a subgroup (N=39) of amnestic MCI participants with presumed AD etiology.[68] Another RCT by the same group that enrolled 226 subjects showed no difference in the ADAS-cog score between treatment groups; however, they only enrolled subjects with mild cognitive disorders.[69] In a retrospective cohort study, the galantamine-memantine combination (N=53) showed significantly better efficacy for cognitive functions than the donepezil-memantine combination (N=61) in AD patients.[70] Hence, one can speculate that the galantamine-memantine combination may be effective for severe AD only. Since both donepezil and galantamine have cholinergic action, while memantine is common to both treatment groups, one can hypothesize that the α7nAChR action of galantamine coupled with the NMDA-R action of memantine may have a synergistic effect,[56,59] resulting in better cognition as in the Matsuzono study.[70] Both α7nAChR and NMDA-R target the KP. Therefore, the combination of galantamine and memantine using multitargeted directed ligands may be particularly beneficial in the treatment of AD.[71,72] None of the previously mentioned studies measured KP metabolites such as KYNA, KYN, QUIN, anthranilic acid (AA), 3-HANA, and 3-HK; KYNA/KYN, KYNA/QUIN, QUIN/KYNA, KYNA/3-HK, and AA/KYN ratios; or picolinic acid.[73-81] Indeed, KYNA/KYN, KYNA/QUIN, and KYNA/3-HK are ratios used to estimate the balance between the neuroprotective and neurotoxic metabolites, which reflect the neurotoxic challenge to the brain.[82,83] The advantages of combining galantamine and memantine are summarized in Table 2.

Other biomarkers

Accumulating evidence indicates a lack of trophic support in the brains of AD subjects.[84] In particular, decreases in BDNF levels have been reported in the CNS and blood of AD patients.[84] BDNF provides neurotrophic support and is a key molecule in the maintenance of synaptic plasticity and memory storage.[85] Interestingly, both galantamine[86] and memantine[87] have been shown to induce BDNF expression in rodent studies. Hence, the galantamine-memantine combination may be more neuroprotective and beneficial over other AChEIs and AChEI-memantine combination in the treatment of AD.

Mismatch negativity (MMN) is reduced in AD and may be utilized for early detection of AD.[88,89] In human studies, encenicline[90] (α-7 nicotinic partial agonist) and memantine[91] have enhanced MMN compared to placebo. The underlying pathophysiological mechanism of MMN may be the interaction of α7nAChR and NMDA-R;[92] hence, the galantamine-memantine combination may enhance MMN[93,94] more than one (nicotinic or NMDA receptor) mechanism of action.

Oxidative stress is an integral part of the pathophysiology of AD;[95] thus, antioxidants may be useful treatments.[96] Galantamine prevented the oxidative damage induced by amyloid-beta peptide in rat cortical neurons.[97] Similarly, memantine also has antioxidant properties.[98,99] Glutathione, glutathione reductase, superoxide dismutase (SOD), and other oxidative stress and antioxidant biomarkers may be utilized to monitor progress[100] with galantamine-memantine combination treatment. Preclinical evidence is suggestive of potential benefit of antioxidant treatment. However, RCTs in AD did not achieve the expected outcomes and benefits.[101] It has been argued that a "single antioxidant" may be incapable of sufficiently counteracting the complex cascade of oxidative stress.[102] The galantamine - memantine

combination as "double antioxidants" is promising. The "double antioxidants" approach was corroborated in a study that found the galantamine-memantine combination increased the SOD2 immunoreactivity and preserved spatial memory after ischemia-reperfusion injury transient global cerebral ischemia in gerbils.[103] This finding was not seen with either galantamine or memantine alone.[103] Finally, KYNA is also an antioxidant.[104]

Conclusion and future directions

In addition to cholinergic and glutamatergic dysfunction, alteration in the KP appears to underlie the symptomatology of AD. Therefore, in addition to targeting cholinergic and glutamatergic pathways, modulation of the KP may be a novel treatment strategy. Also, targeting the KP metabolites that facilitate KYNA synthesis and reduce the formation of QUIN may emerge as a new therapeutic strategy for AD and may offer a valuable strategic option for the attenuation of glutamatergic excitotoxicity and neuroprotection. Well-designed RCTs studying efficacy and tolerability of combined treatment in AD that also measure the relevant KP metabolites, MMN, BDNF, and oxidative stress biomarkers are warranted. Although the galantamine-memantine combination is the standard of care for the treatment of AD, it is still underutilized. Positive RCTs may lead to FDA approval of the combination, which may lead to greater utilization in clinical practice.

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Case report

Sulpiride induced agranulocytosis: a case report

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Abstract

Sulpiride is an antipsychotic medication which is used commonly by some clinicians to treat schizophrenia and psychosis. It is prescribed both in out-patients clinic as well as on the wards. Sulpiride induced leucopenia is rare. Clinicians prescribing sulpiride do not routinely check for this side effect. The mortality from drug induced agranulocytosis is reported to range from 5-10%. In this case report, we describe an 80 year old woman treated with sulpiride, who developed leucopenia within a week of commencing treatment. If leucopenia is not detected promptly, it can progress to agranulocytosis. Although a rare side effect, clinicians prescribing sulpiride need to be aware of this potentially life threatening side-effect. Repeating full blood count within a week of prescribing sulpiride could be worthwhile. Unexplained fever or infection following treatment with sulpiride should prompt immediate haematological investigations.

Key words

Agranulocytosis, leucopenia, side effect, sulpiride,

Introduction

Agranulocytosis induced by antipsychotic drugs especially clozapine is well known; hence clozapine therapy requires mandatory monitoring of white blood cells and absolute neutrophil count.[1] Leucopenia or agranulocytosis induced by sulpiride is very rare. This case report is about sulpiride induced leucopenia which was discovered incidentally during a routine blood test.

Sulpiride is an antipsychotic medication which belongs to the substituted benzamide group. It is indicated in schizophrenia and it acts as a selective antagonist at the dopamine D2 and D3 receptors. In this case report we have highlighted that clinicians need to be careful when prescribing sulpiride and ensure that patients are closely monitored for this potential side effect.

Case history

An 80 year old Caucasian lady was referred to Old Age Psychiatry by the acute medical team due to ongoing concerns regarding depressive as well as psychotic symptoms. She was previously well and functioning independently. Preceding the mental health referral, she was evaluated by the medical team for worsening confusion. Her preliminary blood investigations showed raised liver enzymes (alkaline phosphatase 758 U/L and ALT 372 U/L), the cause of which was unclear. Full blood count (FBC) showed a raised white cell count (WCC) (13.2×10^9/L) which declined spontaneously to 7.7×10^9/L in six days and remained stable thereafter (7.8×10^9/L, a week later). A subsequent liver ultrasound scan was reported as normal. Electrocardiogram (ECG) showed prolonged QTc (484msec); blood tests did not demonstrate any electrolyte abnormalities that could have caused this. There was no history of blood dyscrasias.

The patient had a background history of myocardial infarction two months earlier. Due to concerns over her liver function, her medication for hypercholesterolemia (atorvastatin) was discontinued. She was commenced on sertraline for low mood and was referred for further psychiatric evaluation.

On initial assessment, the patient displayed low mood, psychomotor retardation, loosening of association of thoughts and a limited insight into her mental health difficulties. She expressed persecutory delusions and delusions of guilt. Auditory hallucinations were also reported. She became poorly compliant with medications and was refusing to have blood tests. Therefore, she was placed on compulsory admission under the Mental Health Act (Section 2), and was commenced on aripiprazole 2.5mg per day, whilst continuing sertraline.

The patient became increasingly restless and agitated on aripiprazole hence this was discontinued. In view of a history of myocardial infarction, prolonged QTc and abnormal liver function, and intolerance with aripiprazole, the available treatment options were discussed within the treating team including the pharmacist. Following discussion and agreement with the patient, she was started on sulpiride 100mg once daily initially, which was increased to 150mg once daily around five days later. Her medical treatment for cardiovascular co-morbidities included perindopril, bisoprolol, lansoprazole, aspirin and ticagrelor.

The patient demonstrated a substantial improvement in mental state on sulpiride, with a prompt resolution of psychotic symptoms and improvement in mood. Eight

days into the treatment with sulpiride, her admission status was re-graded as voluntary (informal) because she expressed willingness to engage with the treatment plan.

The FBC was rechecked on day 8; results showed leucopenia with a WCC of 1.8 × 10^9/L and neutrophil count of zero. The patient was asymptomatic from a medical perspective. Following a comprehensive discussion with the haematology team, a conclusion of sulpiride induced agranulocytosis was made and the drug was discontinued. The patient received three subcutaneous injections of granulocyte colony stimulating factor (G-CSF) 300 micrograms on alternate days. Her WBC and neutrophil count came back to normal values two days after the first injection of G-CSF.

After this, the patient was prescribed olanzapine. She was also given electroconvulsive therapy (ECT) following a review and approval from the cardiology team.

The patient responded well to a total of eight ECT treatment sessions. Her mental state improved and she became euthymic. She was subsequently discharged from the unit after four months of inpatient stay.

Discussion

This patient had deranged liver function test as well as a history of recent cardiovascular event hence sulpiride was commenced considering it as a safer option. It is also known that sulpiride has a low effect on the QTc interval. She was tried on other antipsychotic medication but her liver function was getting worse. Her physical health was being closely monitored considering co-morbidities and because of the reduced food and fluid intake. The baseline blood investigations were repeated on a routine basis and FBC showed agranulocytosis. She had no symptoms suggestive of agranulocytosis. There were no obvious causes for the agranulocytosis; except the possible side effect of suliride which was recently prescribed. Once sulpiride was discontinued and she was commenced on G-CSF, WBC count improved quickly. Her LFT too gradually improved. Sulpiride induced leucopenia or agranulocytosis is rare and hence a yellow card (British National Formulary) was submitted.[2]

Many medications are reported to be associated with agranulocytosis. King and Wagner analysed surveillance data for reports of haemopoietic disorders with 16 antipsychotics in common use.[3] They found no evidence of any increased risk with high-potency drugs such as haloperidol or pimozide or with the newer drugs such as sulpiride or risperidone. A systematic review of agranulocytosis induced by non-chemotherapy drugs did not find any evidence about sulpiride causing agranulocytosis.[4] There is a case report of agranulocytosis induced by proton pump inhibitors (omeprazole and esomeprazole) however a genetic mutation was considered to be associated.[5] However in the case described in this report, she continued to have lansoprazole before without any agranulocytosis. Besides, following discontinuation of the sulpiride the blood counts returned to normal levels, suggestive of possibility of the associations of sulpiride with the agranulocytosis.

Conclusion

It appears that leucopenia and neutropenia are rare side effects of sulpiride. However considering their seriousness, these rare side effects should be kept in mind and caution should be exercised while prescribing sulpiride. FBC monitoring may be considered, especially if there are suggestive symptoms.

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View point

Traumatic brain injury in elderly and mental health implications: what can we prevent?

Sujita Kumar Kar, Satyajit Panda

Abstract

Traumatic brain injuries in elderly are a major health concern. The manifestations of traumatic brain injury may be different than that of adults, which often lead to misdiagnosis and hence inappropriate management. Trauma in elderly is preventable to a larger extent. The consequences of traumatic brain injury can be minimized through appropriate preventive measures. Many epidemiological studies revealed the fact of greying global population, which is more so in many Western countries. Hence, focussing on the preventive aspect of traumatic brain injury in elderly becomes the public health importance as it is likely to limit the disability, burden of care on caregivers as well as treatment related expenses on traumatic brain injury.

Key words

elderly, prevention, traumatic brain injury

Elderly population constitutes a major part of the general population. As per the census of India-2011, 8.57% of Indian population is more than 60 years of age.[1] Elderly people are vulnerable to many health-related issues compared to the general population. As per the report of recently conducted National Mental Health Survey 2015-16, the prevalence of lifetime and current mental morbidity in above 60 years population were 15.11% and 10.90% respectively, whereas among the general population the lifetime and current prevalence of mental morbidity were 13.67% and 10.56% respectively.[2]

Traumatic brain injury (TBI) has significant public health importance. Although, the risk of traumatic brain injury increases by many folds in young adults; older patients fairly worse than younger population, with high rates of morbidity and mortality.[3] The survivors of traumatic brain injury live a life with disability and poor quality of life. Commonly, road traffic accidents and falls result in traumatic brain injury in elderly.[3,4] Head trauma in elderly, commonly present with subdural hematoma, intracerebral hematoma or contusions; however mostly have an absolutely normal neuroimaging at the time of presentation to a clinical setting.[4] In elderly, atrophy of the brain results in expansion of volume of the subdural space, which facilitates a shearing force on the bridging veins and progressive accommodation of subdural hematoma.[4] A chronic subdural hematoma caused by a trivial injury is often forgotten by the patient and their caregivers. Many of the elderly individuals receive anti-coagulants/antiplatelet agents (aspirin, clopidogrel) for co-existing medical conditions, which may increase the risk of chronic subdural hematoma. These medications not only aggravate the sequelae of a traumatic brain injury but also have an impact on surgical management.[4] Common presenting symptoms in these patients are headaches, dizziness, depression, fatigue, mood disturbances, amnesia, cognitive impairment, language disturbances, focal neurologic deficits and decreased level of sensorium. Minor TBI is silent, often forgotten and because it is fairly common in older people, neuropsychiatric manifestations may serve both as a clue and a consequence of old injury.

Traumatic brain injury in elderly may present with various neuropsychiatric manifestations. Mild traumatic brain injury is characterized by largely axonal injury, which may manifest in the form of impairment of the working memory.[5] Moderate to severe traumatic brain injuries are associated with more severe and durable cognitive deficits in addition to neurologic deficits.[5] Assessment of the severity of head injury is usually based on Glasgow coma scale (GCS) on the patient at the time of presentation according to the initial severity of the damage to the brain without considering its long-term impact on cognition. Post-traumatic cognitive symptoms may be in the form of impairment of attention and concentration, memory deficits, impairment of executive function. Patients with traumatic brain injury also report about mood changes like increased irritability, anxiety or low mood.[5] Frequent mood swings, impulsivity and apathy may be seen in many patients. The prevalence of depression following traumatic brain injury ranges from 20 to 40% during the first year of trauma.[6] Similarly, suicidal behaviour also increases by three to four fold following traumatic brain injury.[6] Patients with traumatic brain injury may have somatic manifestations in the form of headache, lethargy, fatigue, dizziness and alteration in sleep.[5]

The neuropsychiatric manifestations associated with traumatic brain injury depends upon the site of brain injured and extent of injury.[5] A recent study revealed that the severity of head injury have significant association with cognitive deficits and physical symptoms.[7] TBI has been seen as a risk factor for Alzheimer's disease in epidemiologic studies with evidences of beta-amyloid deposition present in both conditions.[8]

Depression following TBI is commonly treated with selective serotonin reuptake inhibitors (SSRIs).[6] SSRIs are effective for the mood symptoms (depressive and anxiety), but have no effect on the neurocognitive symptoms.[9] A recent meta-analysis of randomized controlled trials had revealed that SSRIs like sertraline are effective in treating the depressive symptoms following TBI.[10]

Benzodiazepine use and abuse are common in elderly. Benzodiazepine use increases the risk of fall leading to head injury. Limiting the use of benzodiazepines and keeping a close watch on patients on benzodiazepines, will help in minimizing the risks of fall and subsequent head injury in elderly. Cognitive disorders (delirium and dementia) are common in elderly. Sensory deficits (peripheral neuropathy, hearing and visual difficulties) are also common in elderly. Cognitive deficits and sensory deficits increase the risk of fall and head injury in elderly. Pre-existing cognitive deficits get further worsened after traumatic brain injury in elderly.

Traumatic brain injuries in elderly as well as their complications are preventable to a greater extent. Appropriate measures can minimize the risk of fall subsequent traumatic brain injury as well as the complications of traumatic brain injury. Cautions during driving and walking, adequate caregiver supervision, adequate correction of visual and hearing difficulties, management of medical morbidities, avoidance of substance use, appropriate dementia care (for patients with dementia) may help in preventing traumatic brain injury. Although workplace disability and employment are less of an issue as compared to young adults, there may be significant impact on relationship, adjustment with surrounding and on-going rehabilitation. Every minor head injury in elderly needs to be taken seriously and patients must undergo neurological evaluation for early identification and timely management. New onset neuro-behavioural disorder or focal neurologic deficit in an elderly patient with trivial fall or injury may suggest a sequelae of head injury several weeks back. Computed tomography (CT) or Magnetic Resonance Imaging (MRI) is commonly able to detect neuropathology in traumatic brain injury.[11] Hence, neuroimaging may play a decisive role in planning treatment. In addition to this, neurophysiological and neuropsychiatric evaluation of these patients may be useful.[12] As the manifestations of traumatic brain injury are multifaceted and need collaboration between neurosurgeon, neurologist, psychiatrist and physiotherapist as well as psychologist, there is a need of multi-disciplinary team approach for the holistic management of traumatic brain injury in elderly.[12] Traumatic brain injury in elderly is an under-researched area.[13] There is lack of consensus guidelines for management of traumatic brain injury in elderly. As majority of clinical research excludes elderly patients from study due to many ethical concerns, there is paucity of evidence. More research is required on TBI in elderly population for effective prevention. Appropriate preventive measures in elderly population, are likely to limit morbidity & mortality, burden of care on caregivers as well as treatment related expenses on traumatic brain injury.

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Research article

Five years' experience of a hospice service for people with dementia

Ann Regan, Michael Tapley, David Jolley

Abstract

Background: Dementia is recognised as a terminal condition influencing the quality of life for many people approaching death. Symptoms and distress may be missed or misinterpreted in the non-specialist settings where people receive care. Involvement of the expertise of hospices offers hope for better care. **Aims:** to describe the experience and impact of a hospice-based service for people with dementia. **Method:** data are presented from 5 years' experience. Data were collected routinely at referral and clinical contacts and stored on a database. Measures did not include quality of life or estimates of prognosis. **Results:** There were 468 referrals in 5 years, most from care homes and general practitioners. Most were seen within days of referral. Interventions produced reduction of pain and neuropsychiatric symptoms. The hospice dementia team has become an important component of end of life services, caring for individuals, providing education and undertaking research. **Conclusions:** This service has had a positive influence on care of individuals and families, and added confidence and competence to other services. Sadly few hospices have yet followed this promising path.

Key words

dementia, hospice, palliative care, service integration, sustainability

Introduction

It is now accepted that dementia as a syndrome brings forward death. It may be the cause of death, and influences the last months of life for many older people with multiple pathologies.[1] The syndrome is based on one or more of a list of specific degenerative pathological conditions: Alzheimer's disease, Fronto-temporal dementia etc.[2]

People are encouraged to 'live well' with dementia and to expect that care from their family and friends will be complemented by the availability of services when they are needed. Specific medication plays a part for some people with Alzheimer's disease;[3] and non-pharmacological therapies can influence quality of life for the better.[4]

Few people with dementia now survive to die in their own homes in the UK or other European countries.[5] Support at home into the very late stages of the condition is associated with increased likelihood of eventual death in an acute hospital.[6]

It has become understood that people with advanced dementia are at risk that their experience of pain and other adverse symptoms will not be recognised. They may be denied appropriate symptomatic treatments or receive responses to behavioural change which are counterproductive.[7,8]

Most specialist geriatric medicine and psychogeriatric services in the UK have lost their long-stay component.[9,10] End of life care rests mostly with privately run nursing homes and care homes. A palliative approach, particularly as practised by the hospice movement, offers hope of better care for people with dementia at the end of their lives, working in liaison with all other available and relevant services.[11]

Method

Willow Wood Hospice in Ashton under Lyne established a specialist nurse-led service for people with dementia in 2012. We report here its development and experience over a five year period. This activity and the report are approved by the board of Willow Wood Hospice.

The service was inspired by the St Christopher experiment of Scott and Pace,[12] and has been described previously.[13] This local hospice, serving a population of 253,931 with 43,515 aged 65 years and older (in 2014) agreed with primary care, mental health, the general hospital, local authority, relevant voluntary groups and the Macmillan nursing service, to follow the St Christopher's template: receiving referrals from any relevant agency where it was felt that an individual with dementia or their family was experiencing distress in the advanced stages of the condition. First contact would be by the specialist nurse with recourse to medical or other advice as seemed appropriate. Basic demographic details and symptom profiles have been collected systematically throughout the duration of the service and are extracted here for this report. Measures did not include formal estimates of quality of life, nor estimates of prognosis. In

addition to this service for individuals and families, the hospice provides educational support and advice to professionals in other services.

Results

There have been a total of 468 referrals over the five years with 302 females and 166 males. Their average age was 82.7 years.

Source of referral

Most referrals originated from care home staff (30%) or general practitioners (GP) (39%) with 11% from hospital staff which latterly included an Admiral Nurse team. Community psychiatric nurses, Macmillan Nurses, district nurses and sundry other sources made up a further 20%. A total of 44 GP practices, including some from neighbouring localities, have either referred to the service or acted on recommendations made by the specialist nurse. This spectrum of referral sources has been consistent over the five years.

Location at the time of referral

Fifty five percent were seen in a care home, 30 percent were seen in a domestic setting, and 15 percent were seen in a general hospital bed.

Speed of response

Average response time to first contact was 4.8 days, ranging from 0 to 41 days, with a median of 4 days. A number of factors contributed to the few delays before first contact, including consideration of patient or family requirements and convenience.

Interventions

The most powerful intervention was the first contact when time was taken to review the history of the current situation and present problems with the individual and their carer(s). The process of listening, clarifying and expressions of understanding could be seen to provide relief and hope. Most of these patients and carers were known or had been known to other services. Sometimes they had been discharged with pointers to other services which might be helpful, or advised to be back in touch when matters became worse. This feeling of emptiness and aloneness in unknown territory left people fearful and unsure of how they could manage. Time spent with an informed and competent nurse, with the backup the hospice brought renewed strength. They and their family knew they would not now be left to be alone with their difficulties. Review of treatments and use of current services led to suggestions for adjustments in many cases. Contact and discussion with other professionals was often productive. Sometimes medication could be reduced or simplified. Pain was the most unrecognised of symptoms. Treatment with analgesics, sometimes as slow release patches, was often helpful. Ongoing follow up by our service or others was key to continued confidence.

Symptom relief

Symptoms of pain and neuropsychiatric distress were routinely monitored at referral and after interventions using the Pain Assessment in Advanced Dementia (PAINAD) Scale and Neuropsychiatric Inventory (NPI) respectively (Figures 1 and 2). There was a substantial reduction in symptoms for most individuals on both scales as demonstrated by the star maps.

Deaths

Of the 468 patients referred to the service since July 2012, 272 were known to have died by the end of June 2017. Only four people died before they could be seen. Fifty two were seen once only for advice but most received mutiple follow up contacts – up to 20 or more.

Place of death

Of those known to have died, 32 percent died in a residential care home and 30 percent in a nursing home. Seventeen percent died in a general hospital bed. Six percent entered the hospice for terminal care and 14 percent were in their own homes.

Other activities

Network meetings

An innovative regular bi-monthly Dementia Network meeting for professionals concerned with the care of people with dementia has been hosted by the hospice.[14] Sharing of good practice and concerns is encouraged. Recent themes have included the impact of alcohol, HIV complications, Parkinson's disease, driving and changes in DoLS legislation.[15]

Liaison with other services

There is close working relations with the general hospital trust, the mental health trust, local authority End of Life Strategy Group.

Education, training, sharing the story and research

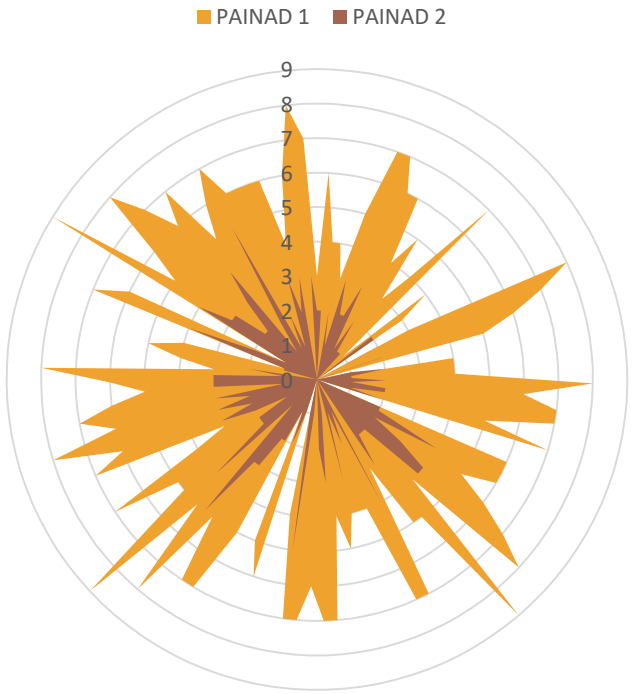
The team provides training sessions on end of life dementia care and communication as dementia advances, for domiciliary carers, care home staff, social workers and others. Trainee doctors go out on visits with the specialist nurse. Nursing students and medical students are regularly attached to the service. The team contributes to study days and has published reports of their experiences.[16,17,18]

Recent innovations

Dementia Café

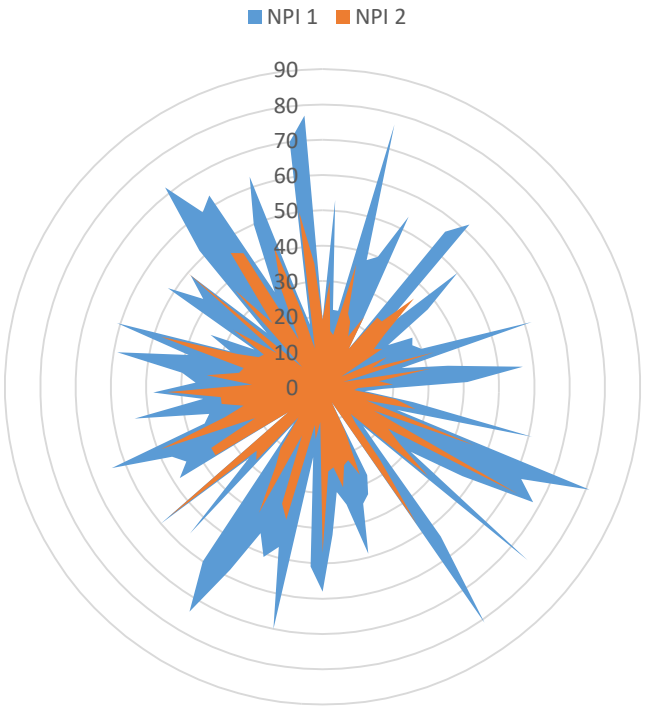
A monthly Dementia Café in the Day Services area of the hospice is a new development during 2017. A range of professionals provide therapy which enhances relaxation and offer support to carers. Support between fellow carers is helpful to those isolated in their caring role.

Figure 1: Impact of interventions on PAINAD scores



PAINAD: Pain Assessment in Advanced Dementia Scale; PAINAD 1: Pain score at referral, PAINAD 2: Pain score after interventions. Source: http://geriatrictoolkit.missouri.edu/cog/painad.pdf

Figure 2: Impact of intervention on Neuropsychiatric Inventory scores



NPI: Neuropsychiatric Inventory; NPI 1: NPI score at referral; NPI 2: NPI score after interventions. Source: http://www.ton.hofstede.nl/npi-c.pdf

Hospice linking with Mental Health Units

The first five years' experience of a hospice service for people with dementia has increased confidence that the hospice and local mental health units can work together. A new relationship between the different teams is seeing the development of trust and respect based in an understanding of how we can complement each other's skills.

Plans for additional development

There are prospects for an enhanced link with the Emergency Department (E.D.) of the general hospital: people with dementia who present at the emergency department who may not need hospital admission, but do need more care and support will be offered direct referral to the Specialist Dementia Nurse.

Discussion

This hospice-based dementia service has established a place in the spectrum of services available to people with dementia and their carers. A consistent pattern of referrals has evolved and been sustained over a five year period at a rate which is almost twice that described by the St Christopher's pioneer model,[12] yet has not overwhelmed the hospice.

Most of the work has occurred outside the walls of the hospice – in people's homes, care homes and the local general hospital. This and the regular network meetings have encouraged developments in these other agencies. The general hospital has a team of Admiral Nurses, who are transforming the experience of time in hospital for people with dementia and their families. The Public Health Unit has pursued a number of initiatives to foster and evaluate the use of art and music therapies as alternatives to medication. Joint work with mental health services is now emerging.

Many individuals have been enabled to spend their last days at home or in their established care home. Perhaps more impressively and more importantly, their symptoms of distress and behavioural change have been ameliorated.

This approach has produced a positive feeling of confidence through competence in an area of dementia care which was previously a cause for great concern and is recognised to need special focussed care, as recognised in NICE guidance.[19]

It is an approach which works where previously individuals and families and professionals were left to struggle with problems which were beyond their control. Sarah Amador and her colleagues have recently reviewed similar initiatives.[20] Sadly they could identify only 15 services demonstrating such a positive commitment of end of life care for people with dementia. A more optimistic picture emerged from a Marie Curie survey of support for care homes, where dementia is a common mode or cause of death.[21, 5]

Louise Jones and colleagues gathered 29 statements from people with dementia, carers, health and social care professionals, experts and 'the literature', to inform a 'model for integrated care at the end of life in advanced dementia'.[22] The product is worthy and is likely to receive general agreement. The doubt is whether it will be turned into meaningful action. The advantage of the St Christopher's model, the Willow Wood model and other hospice-based dementia services, is that they have been created in a working environment and they do what is required and more.

The situation resonates with that of geriatric medicine and psychogeriatrics which began through services created by enthusiasts in a few places and eventually attracted sufficient recognition and support to become 'mainstream' requirements.[23] It is disappointing that those services have been pruned of their commitment to comprehensive care.[24] Some have generated outreach and support arrangements for care homes.[25] This is where much of the care and the dying of people severely disabled by multiple pathologies in the months before death is played out.[26] Yet this is itself a complex and often underprivileged environment, mostly funded as a private sector venture but dependent upon monitoring and finance of some placements by the Local Authority, with healthcare almost reluctantly accepted as an NHS responsibility within Primary Care.

It is disappointing that there has not been growth in the number of hospice-based services for people with dementia. The experience of people with dementia and their families continues to be that early recognition is not followed by robust and trusted care to the end of life.[27] Here we have a good idea which could be replicated with benefit to the wider population. The cause of dementia and families is attracting media and political attention but unfashionable areas of health and social care remain starved of resources needed to make best use of the evidence available.

Conclusions

There are many models of healthcare. At these challenging times a hospice can provide a specialised overview of advice as it has access not only to a specialist nurse but also doctors skilled in helping manage distressing symptoms who understand not only the medication but also the social context of patients' lives in their locality.

As this data from five years' experience demonstrates, when a hospice dips its toes in the pool of dementia care, it has great benefits for patients and families, but also a stimulating, healing influence on other health and social care agencies. It is sustainable: not flooded by large numbers of patients who drain or divert resources away from patients who were traditionally served by hospices. Willow Wood has become more inclusive in the patients it serves, and is learning to integrate its holistic and medical skills into many areas so that more people can benefit from the flourishing of ideas that has grown from Cecily Saunder's original hospice model which focussed

on the care of people with cancer and neurological conditions. We must ensure that the vision and demonstrations of a few are not lost to history.

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Insight

Healthy Ageing Conference 2018: effectiveness of a public education event

Brajaballav Kar, Shreyan Kar

Abstract

This article summarises the role and effectiveness of Healthy Ageing Conference 2018 as a public education event; improving the general awareness about the issues relevant for elderly. It also tried to emphasize that the academic events such as conferences may have a role to play for public education through specific attention to the agenda and the method of delivery of information relevant and useful for the general public. From the responses, interactions and feedbacks of the attendees, it was clear that events can be designed in a way that is helpful for elderly population and their carers in general; which may have positive influence on the care and management of their physical, mental and social concerns.

Key words

academic, conference, effectiveness, elderly, public education

Introduction

It is well known that information and education of the patients and their caregivers, helps in management of clinical conditions. Similarly education of clinicians, policy makers, health care decision makers and implementation departments are essential for positive health outcomes. In various ways and methods, educational programmes improve health and are particularly helpful in public health issues improving outcomes.[1] Educational programmes focusing on health promoting behaviours and lifestyle changes are reported to help in successful ageing. It can decrease ageing related morbidities, improves health and decreases illness related cost.[2] In addition, educational level itself has been associated with positive effect on health; although there may be many confounders linked to education.[3]

It is well known that elder abuse is common and needs to be addressed with multipronged approach and by raising awareness about it through public education.[4] A Helpage India Report on Elder Abuse published in 2018 reported massive concerns of elder abuse in India. It particularly put Bhubaneswar, the capital city of Odisha in Eastern India in a poor light which suggested that 87% prevalence of elder abuse, which was the highest (along with Delhi) amongst the areas studied. A huge proportion of elderly (82%) reported disrespect, 22% experienced slapping and beating, 29% had verbal abuse, 31% were exploited economically and 29% complained of neglect.[5] The scenarios throughout the country in the studied regions were alarming as well.

The State of Odisha has a Senior Citizens Policy - 2016 which emphasizes on geriatric care, counselling services and day care centres for elderly. The State has created a senior citizen security cell to register all elderly persons staying alone in the twin cities of Bhubaneswar and Cuttack. Specialized Geriatric clinic for elderly is also one of the programmes launched by the state government.[6] It is understood that there are various organisations available to support the elderly; however their effectiveness is not clear.[7] There remain various concerns which affect quality of life of the elderly in Bhubaneswar,[8] like any other places.

Geriatric Care and Research Organisation (GeriCaRe) organised a Healthy Ageing Conference 2018 in Bhubaneswar on 11 August 2018. This was a public education event targeted for elderly and their caregivers. This article tried to evaluate the educational value and benefit of such programmes for the elderly.

The Healthy Ageing Conference 2018

The conference was divided into broad subject areas of medicine, cardiology, psychiatry, obstetrics and gynaecology, oral and dental hygiene, clinical psychology covering various aspects relevant for the elderly. Consultants of these subjects from various academic institutions attended, delivered talks and answered questions from the audiences.

Specific topics covered were: Healthy ageing concepts: areas for action and self-actualisation; common medical concerns in old age (diabetes, hypertension, obesity, hypercholesterolemia); preventing cardiovascular risks (myocardial infarction and stroke); dental issues in elderly; psychosocial issues and management (stress, abuse, depression, coping); dementia and old age psychiatric problems by; and information about cancers.

Figure 1: Inauguration of Healthy Ageing Booklet at the Healthy Ageing Conference 2018

These were followed by a panel discussion on biopsychosocial issues in old age and question-answer session. There were discussion on osteoarthritis and other chronic non-communicable diseases.

GeriCaRe encouraged participation from the general public through various means of advertisement of the conference including social media. The conference fee was highly subsidised by the GeriCaRe to facilitate greater attendance; in addition to this there were options of free attendance for those in need.

Information booklet

A booklet titled Healthy Ageing was released in the conference and distributed among participants.[9] It contained information on various topics such as: healthy lifestyle (exercise, sleep hygiene, diet), activities, stress management, common illnesses in old age angina and heart attacks, elderly pain management, age-related eye diseases, depression in old age, dementia, know your numbers related to various physical examinations and investigations, oral health care for elderly, know your medicines, preventing falls in old age, , web resources for health and other topics related to elderly, questionnaires on various assessment, policies and laws related to elderly and organisation working in the field of geriatrics. It has been reported that older adults are keen to learn new technologies and methods;[10] and in this regard, not only the booklet with information, but web resources are helpful. These can be presented in phones, tablets or computers and elderly should be supported to utilise this resource.

Health screening and cardiovascular risk assessment

There were arrangements in the conference for the attendees to share the health concerns and cardiovascular risks through a semi-structured questionnaire. GeriCaRe distributed Health Passports which is helpful to record with various personal health related information and individualised health actions. This helped to raise awareness about the possible risk factors which are prevalent.

Discussion points raised by participants

During the question answer sessions the participants raised many issues regarding health of elderly and sought clarifications. The questions ranged from oral hygiene, hypertension, diabetes, osteoarthritis, stress management, forgetfulness etc. It was observed that elderly patients with chronic diseases often have to get advice from multiple doctors in different departments and there were no scope for comprehensive assessment and intervention as the specialist services were too compartmentalised. It was brought to the fore that they do change their doctors in case they are not satisfied with the outcome and at times get contradictory advices. As a result, confusion and sometimes distrust develop between patient and their carers with the medical practitioners. It was encouraged to know about their illness, treatment suggested and participate in the decision making, rather than just seeking views from different clinicians in a way of 'doctor shopping'.

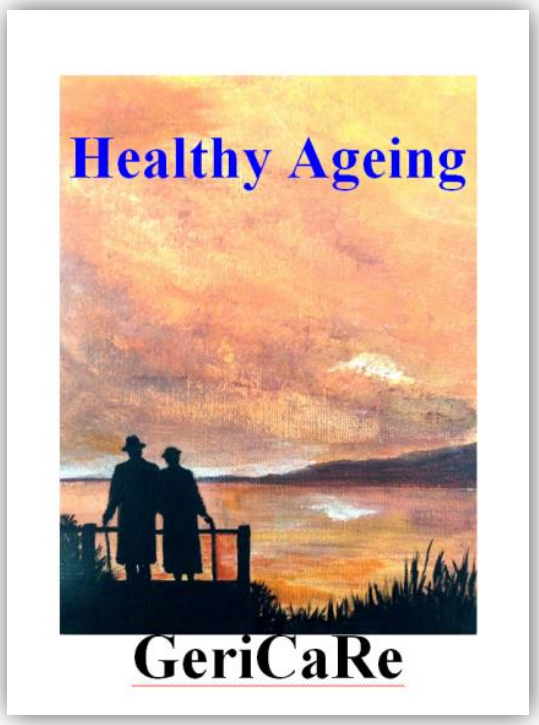
It was also observed that elderly patients had concerns about their diet where in doctors advised them not to have usual food high in carbohydrate and saturated fat. They wanted to know dietary changes needed in the old age.

Feedback from attendees

Attendees were requested to provide anonymous feedback on various aspects of the conference. A semi-structured questionnaire with Likert type responses (lowest grade 1 to highest grade 5) was used. These included topics, facilities, meeting the expectation, satisfaction etc. besides suggestions of topics for future conferences. As an overall assessment, 53.7% of attendees considered the programme to be excellent and another 36.6% felt it was very good and 9.8% good. Organisation of the event was considered very good by 48.8% and excellent by 41.5%. The conference met the expectation of attendees mostly by 34.1% and definitely by 51.2%. Information provided during the conference was considered useful mostly by 26.8 and definitely by 65.9%. All these feedbacks had a mean of more than 4 in each item, with modal value of 5; except for the item 'organization of event' has the modal

response value of 4. Most people felt that the conference should be longer and more topics should be covered.

Figure 2: Healthy Ageing information booklet



About the most interesting topic discussed cardiovascular disease was at the top of the list, followed by oral cancer, dental problems, dementia, healthy ageing concept, psychosocial issues and exercise and diet.

Take home message

It was interesting to observe various take home messages reported by the participants. Healthy life style (exercise, diet, life style modification) accounted for 56% of take home messages. Phrases used were: 'healthy life style,' 'life style modification is prevention of disease,' 'live happily,' 'restart hobbies to manage time,' 'rely on yourself,' 'think positive,' 'believe in God,' 'stress is the cause of 80% diseases' and 'we are ageing everyday get prepared for it'.

Suggested topic for future conferences

A vast range of topics were suggested for future conferences or public education events. The common ones were: heart diseases, stress management, exercise, yoga, arthritis, women's health, family and care givers' issues, obesity, diabetes, diet for elderly, gastrointestinal problems, mental exercises, neurological illnesses, eye problems, preventive actions than curative interventions, spiritual living and more interactive sessions.

In general, participants indicated that the conference should be more frequent, in different cities, should cover different specialities, more time for interaction and introduction of practical support like clinical investigations and yoga sessions etc. The feedbacks highlighted the appreciation for the programme and provided suggestions to improve the scope of the conference in future.

Conclusions

The conference and the feedbacks highlighted the need for public education events such as this to improve awareness about the old age related issues. Although the focus was on various chronic non-communicable diseases, there were further areas like diet, lifestyle, spirituality and positive ageing. There was felt need for focussed assessment and intervention facilities for elderly in the community. In addition, it was clear that there was lack of adequate appropriate health related information in local languages.

Conference also identified few areas with further research potential: Issues related to diet and health, methods to deal with multiple and occasional varying and contradicting clinical advice that the elderly get, reasons for lack of or inadequate reliability in the existing health care system, concerns about Internet based health information from unreliable, unverified sources etc.

Considering the feedback from the attendees, it was obvious that the conference met its objective of increasing awareness about the old age related issues, providing information to manage such issues and the help available locally and through other information sources.

Acknowledgement

It is important to highlight the support received from various organisations and individuals in organising the conference: Quality of Life Research and Development Foundation (QoLReF), The Institute of Insight (IoI), Karak Visuals, Sun Pharamaceuticals, GeriCaRe, Saroj Kar, Gaye Johnson; all the speakers: Dr Tushar Kanti Das, MD; Dr Bana Bihari Mishra, MS, MCh (CTVS); Dr Prasanta Mohapatra, MD; Dr Soudamini Dhal, MD; Dr Swarnav Patnaik, MDS; Dr Narendranath Samantaray, PhD; Dr Aditi Abha Rath, BDS; and Dr Nilamadhab Kar, MD, DNB, DPM, MRCPsych; and all the volunteers of the conference.

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Health Information Capsule

Supportive resources for elderly and their caregivers in the UK

Self-care is important for helping people to live healthier lifestyles, maintain their mental and physical wellbeing, live actively and independently for longer, and reduce avoidable demands upon the NHS.[1] This information capsule aims to supply links for the general public to accredited and trustworthy sources suitable for tackling various recognised challenges, with a view to achieving healthier lives; not merely in later life but on a life-long basis.

National Helplines

- The Age UK charity. P: 0800 055 6112. Available from: https://www.ageuk.org.uk/services/age-uk-advice-line/
- Reducing loneliness and social isolation. Silver Line. P: 0800 4 70 80 90. Available from: https://www.thesilverline.org.uk/
- Staying independent and living at home. Independent Age. P: 0800 319 6789. Available from: https://www.independentage.org/
- Tackling elder abuse. Action on Elder Abuse. P: 080 8808 8141. Available from: http://www.elderabuse.org.uk/

Dementia-Related Charities

- Alzheimer's Society. National Dementia Helpline. P: 0300 222 11 22. Available from: https://www.alzheimers.org.uk/get-support/national-dementia-helpline
- Dementia UK. P: 0800 888 6678. Available from: https://www.dementiauk.org/get-support/dementia-helpline-alzheimers-helpline/
- Research participation, via Alzheimer's Research UK (ARUK). P: 0300 111 5 111. Available from: https://www.joindementiaresearch.nihr.ac.uk/contactus
- Young-Onset Dementia. P: 01993 776295. Available from: https://www.youngdementiauk.org/contact-us

Carer-Related Charities

- Carers UK. P: 0808 808 7777. Available from: https://www.carersuk.org/help-and-advice/talk-to-us
- Carers Trust. P: 0300 772 9600. Available from: http://www.carers.org/

General Health Advice and Information

- Staying well during the Winter. Available from: https://www.nhs.uk/staywell/
- Advice on specific health problems. Available from: https://www.nhs.uk/conditions/
- Advice to make best choices about healthy living. NHS Digital Live Well. Available from: https://www.nhs.uk/live-well/
- Urgent (non-emergency) medical advice. NHS 111 Advice Online. P: 111.

Further General Information Sources

The following documents are recommended highly.[2-6]

John Hudson, Bell Library, Royal Wolverhampton NHS Trust, Wolverhampton, Email: john.hudson2@nhs.net

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Creative Expressions

Waiting

Tumpa Banerjee

Ageing

Time doesn't ravage us,
Memory doesn't desert us;
Waves of change
Leave behind pearls of wisdom
And precious lines and creases.
Ageing, the inevitable process,
Makes us pause
And reflect
On the wonderful journey
Called life.

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Manuscript Preparation

Instructions for authors

Introduction

The *Journal of Geriatric Care and Research (JGCR)* is the official publication of Geriatric Care and Research Organisation (GeriCaRe). The *JGCR* publishes original work in all fields of geriatrics, contributing to the care of elderly. Theme based special issues focusing one aspect of care are also published periodically. Manuscripts for publication should be submitted via email <jgcr.gericare@gmail.com>.

The *JGCR* is not responsible for statements made by authors. Material in the *JGCR* does not necessarily reflect the views of the Editors or of GeriCaRe.

Editorial process

The *JGCR* follows in principle the Recommendations for the Conduct, Reporting, Editing and Publication of Scholarly Work in Medical Journals by the International Committee of Medical Journal Editors (ICMJE) and the Committee on Publication Ethics (COPE).

Contributions for *JGCR* are accepted for publication on the condition that their substance (whole or part) has not been published or submitted for publication elsewhere, including internet. If there are other papers from same database, then the authors must send all details of previous or simultaneous submissions.

All submitted articles are peer reviewed. At the first step, the articles are assessed by the editorial board for its suitability for the formal review.

If found suitable, the manuscripts undergo a double-blind peer review. The suggestions received from reviewers are conveyed to the corresponding author. When appropriate, the author is requested to provide a point by point response to reviewers' comments and submit a revised version of the manuscript.

Manuscripts accepted for publication are copy-edited to improve readability and to ensure conformity with *JGCR* style.

Authorship

Authorship credit should be based only on substantial contribution to:

- Conception and design, or analysis and interpretation of data
- Drafting the article or revising it critically for important intellectual content, and
- Final approval of the version to be published

All these conditions must be met. Participation solely in the collection of data or the acquisition of funding does not justify authorship. In addition, the corresponding author must ensure that there is no one else who fulfils the criteria but has not been included as an author.

Group authorship is permitted, but in this case individual authors will not be cited personally.

If a professional medical writer was used for manuscript preparation, their name and contact details must be given in the acknowledgement and any conflicts of interest must be disclosed.

The corresponding author must sign the contributors form on behalf of all the authors, once a manuscript has been accepted. This author must take responsibility for keeping all other named authors informed of the paper's progress.

Unless otherwise stated corresponding author will be considered as the guarantor of the article. However one or more authors/contributors can be guarantor. The guarantor accepts full responsibility for the work and/or the conduct of the study, had access to the data, and controlled the decision to publish.

Declaration of competing interest

All submissions to the *JGCR* (including editorials and letters to the Editor) require a declaration of competing interest. This should list fees and grants from, employment by, consultancy for, shared ownership in, or any close relationship with, at any time over the preceding three years, an organisation whose interests may be affected by the publication of the paper.

Ethics approval of research

The *JGCR* expects authors to follow the World Association's Declaration of Helsinki and base their article on researches conducted in a way that is morally and ethically acceptable. The research protocol must have

been approved by a locally appointed ethics committee or institutional review board.

Every research article must include a statement that the investigators obtained ethical approval for the study (or an explanation of why ethical approval was not needed) in the methods section of the manuscript with the name and location of the approving ethics committee(s).

Patient consent and confidentiality

A statement regarding informed consent must be included in the methodology. Studies involving humans must have written informed consent from the patients. Where the individual is not able to give informed consent for lack of mental capacity, it should be obtained from a legal representative or other authorised person. If consent cannot be obtained because the patient cannot be traced then publication will be possible only if the information can be sufficiently anonymised. Anonymisation means that neither the patient nor anyone could identify the patient with certainty. Such anonymisation might, at an extreme, involve making the authors of the article anonymous. If the patient is dead, the authors should seek permission from a legal representative or other authorised person as a matter of medical ethics.

The authors should check the specific laws in their country. Contributors should be aware of the risk of complaint by individuals in respect of breach of confidentiality and defamation; and must archive the signed informed consent form.

The process used to assess the subject's capacity to give informed consent and safeguards included in the study design for protection of human subjects should be mentioned.

Publication Ethics

Authors should consider all ethical issues relevant to publication. This includes (but not restricted to) avoiding multiple submission, plagiarism and manipulation of figures/data. Any concerns in this regard must be brought to the attention of the Editor and these will be investigated by procedures recommended by the Committee on Publication Ethics (COPE). If conclusive evidence of misconduct is found, the *JGCR* undertakes to publish a correction or retraction of article as necessary.

Clinical trial registration

All clinical trials must be registered in a public trials registry. This is a requirement for publications of the trials.

Qualitative research

The *JGCR* welcomes submissions of reports of qualitative research relevant to the scope of the care of elderly.

Type of manuscripts

Research article

The research article should normally be between 3000 and 4000 words in length (excluding references, tables and figure legends). Only the essential references should be given, preferably not more than 25 beyond those describing statistical procedures, psychometric instruments and diagnostic guidelines used in the study. Authors are encouraged to present key data within smaller tables in the appropriate places in the running text. This applies also to review articles and short reports.

A structured abstract not normally exceeding 150 words should be given at the beginning of the article, incorporating the following headings: Background, Aims, Method, Results, and Conclusions.

Key words: Up to six key words should be provided. Please use Medical Subject Headings (MeSH) as key words.

Article should have Introduction, Method, Results and Discussion sections. Authors may use relevant subheadings under these sections. Introductions should normally be no more than one paragraph; longer ones may be allowed for new and unusual subjects. The Discussion should always include limitations of the paper to ensure balance. A paragraph of practical implications of the observations is encouraged.

Short report

Short reports (brief communications) are based on original research, observational or evaluation studies, clinical audits etc. These are structured as research articles and require an unstructured abstract of one paragraph, not exceeding 100 words. The report should not exceed 1500 words (excluding references, tables and figure legends) and contain no more than one figure or table and up to 10 essential references beyond those describing statistical procedures, psychometric instruments and diagnostic guidelines used in the study.

Case report

Case reports and series require up to 100 word abstract, and the length should not exceed 1000 words (excluding references, tables and figure legends). The written informed consent of the individuals must be obtained and submitted with the manuscript. Please refer to patient consent and confidentiality paragraph for further detail. In general, case studies are published in the *JGCR* only if the authors can present evidence that the case report is of fundamental significance and it is unlikely that the scientific value of the communication could be achieved using any other methodology.

Review

Systematic and narrative review articles should be structured in the same way as research article, but the length of these may vary considerably, as will the number

of references. It requires a structured abstract like that of research articles.

Short review

These articles focus on highly topical issues based on evidence. Professional perspectives, viewpoints, commentary and opinion are included here. It can also include clinical review relevant to the practitioners. These articles are usually more broad-based than editorials. They can include tables and figures. Usual length is around 1500 words (excluding references) with an unstructured abstract up to 100 words.

Editorial

Editorials require an unstructured summary of one paragraph, not exceeding 50 words. Editorials should not exceed 1000 words and may contain no more than one figure or table and up to 10 essential references.

Letters to the Editor

Letters may be submitted either as responses to published articles, to inform about particular situation or raise pertinent issues, as expert opinion or as general letters to the Editor. Letters may be up to 400 words in length with a maximum of 5 references.

Insight

These articles include variety of topics which may reflect an individual perception, involvement or contribution to geriatric care. It can include good practice examples, inspirational experiences and highlight neglected areas. Essays in descriptive prose can be submitted on any topic related to geriatric care. These are usually written by a single author but a second author may be included occasionally. The length of the articles may vary considerably depending upon the topic and may be up to 2000 words excluding references. An unstructured summary of around 100 words is preferred but not mandatory. Use of subheadings is encouraged.

First person account

In first person accounts *JGCR* publishes experiences of older persons or their care providers about the care and concerns of the elderly, that can be considered significant and provide learning points for others.

Columns

These comprise a range of materials considered to be of interest to readers of the *JGCR*. This section includes reviews on book, film or web resources as short articles up to 400 words. Some other examples include News regarding developments that can influence the care of elderly, poems, paintings, photographs, quotations, information about important internet links, etc. These articles are published individually or as fillers at the end of other articles where space allows.

Preparation of Manuscripts

Prepare article in Word, A4 size page, with 1 inch margin, double spaced throughout.

Article information page

1. Type of manuscript:
2. Title of the article: Brief and relevant
3. Running title: not more than 50 characters;
4. Name of the authors: (underline Last name)
5. Details of authors: academic degrees and institutional affiliations, professional address, email
6. Corresponding author: name, address, phone, fax, and e-mail
7. Contributions of each author:
8. Word count for abstract:
9. Word count for the text (excluding references):
10. Number of photographs/images (to be provided separately in JPEG files):
11. Acknowledgement:
12. Competing interests:

No identifiable details beyond this page.

Article Text pages

The article text pages do not contain any identifiable information, for a blind review. It should contain: Title of the article, Abstract and Key words (depending upon the article type) and the Text of the article.

References

Authors are responsible for checking all references for accuracy and relevance in advance of submission. All references should be given in superscripted number in the order they appear in the text. Place superscript reference number after commas and full stops, unless the superscript is attached to authors name or title of book/database. At the end of the article the full list of references should follow the ICMJE style. If there are more than six authors, the first six should be named, followed by 'et al'.

Example of journal articles:

The authors' names are followed by the full title of the article; the journal title abbreviated according to the PubMed; the year of publication; the volume number; (issue number in bracket); and the first and last page numbers.

1. Singh SP, Singh V, Kar N, Chan K. Efficacy of antidepressants in treating the negative symptoms of chronic schizophrenia: meta-analysis. Br J Psychiatry. 2010; 197(3): 174-9.

References to books should give the names of any editors, place of publication, editor, and year. Examples are shown below.

2. Murray PR, Rosenthal KS, Kobayashi GS, Pfaller MA. Medical microbiology. 4th ed. St. Louis: Mosby; 2002.

3. Meltzer PS, Kallioniemi A, Trent JM. Chromosome alterations in human solid tumors. In: Vogelstein B, Kinzler KW, editors. The genetic basis of human cancer. New York: McGraw-Hill; 2002. p. 93-113.

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Personal communications need written authorisation (email is acceptable); they should not be included in the reference list. Unpublished doctoral theses may be cited (please state department or faculty, university and degree). No other citation of unpublished work, including unpublished conference presentations, is permissible. Further information about the references can be availed from http://www.nlm.nih.gov/bsd/uniform_requirements.html

Tables

Tables should be numbered and have an appropriate heading. The tables should be mentioned in the text but must not duplicate information. The heading of the table, together with any footnotes or comments, should be self-explanatory. The table should be placed at the desired position of the manuscript. Authors must obtain permission from the original publisher if they intend to use tables from other sources, and due acknowledgement should be made in a footnote to the table.

Figures

Figures should be clearly numbered and include an explanatory legend. All figures should be mentioned in the text and the desired position of the figure in the manuscript should be indicated. Authors must obtain permission from the original publisher if they intend to use figures from other sources, and due acknowledgement should be made in the legend.

Abbreviations, units and footnotes

All abbreviations must be spelt out on first usage and only widely recognized abbreviations will be permitted. Abbreviations usage should be consistent throughout the article. Use abbreviations sparingly; consider using one if it is repeated more than three times.

The generic names of drugs should be used.

Generally, SI units should be used; where they are not, the SI equivalent should be included in parentheses.

Footnotes are not allowed, except table footnotes.

Statistics

Methods of statistical analysis should be described in language that is comprehensible to most readers. Raw data for the studies may be asked at any time up to 5 years after publication of research in the *JGCR* and the authors are suggested to keep these safe.

Proofs

A proof will be sent to the corresponding author of an article which should be sent back within 7 days.

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