

Geriatric Health Care in India: A Review

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Abstract

Indian population is on a transition over previous years from a state of high birth and death rates to a state of low birth and death rates. This transition along with longevity has led to significant increase in the number and proportion of older persons. This rapid and large growth is further predicted to continue into the coming centuries, and is usually ignored. Along with, it brings a huge burden on the country in various domains, i.e., medical, social and economic. Therefore, it is the need of the hour to be aware about this growing group and their problems, so that, necessary steps and preventive measures can be taken in advance to avoid this ageing population from becoming a drain on resources and a burden on society and the country.

Introduction

Geriatrics refers to the medical care of the elderly people. Gerontology refers to the "study of physical and psychological changes which are incident to old age". India is currently facing a demographic transition with an ageing population. This transition consists of increasing elderly population, due to reduced mortality, reduced fertility and increased life expectancy. People above 60 years are included in elderly¹. Geriatric population is usually neglected and brings with them a large number of medical, social, psychological and economic problems, creating a huge burden on the country. It is the need of hour to know about problems of geriatrics, for their timely detection and management in order to improve quality of life of the elderly and thus decreasing the burden on the country.

Classification of elderly on basis of functional and cognitive status²:-

- A. Group I elderly (functionally and cognitively fit):** They need health promotional activities including nutrition, physical activity, psychosocial support. The goal is to keep them physically and mentally active, to screen for common diseases like diabetes, hypertension, cancer, vision, hearing, promotion of bone health, and vaccination.
- B. Group II elderly (mild functional limitations or mild cognitive impairment):** These are usually in the age group of 70 - 80 years. They need assistance for living, special geriatric clinics for comprehensive assessment and rehabilitation, and constant medical help. Goal is to help them live independently with assistance.
- C. Group III elderly (severe functional limitations or cognitive limitations):** This group needs home

care. Goal is to keep them comfortable in their own surroundings.

Epidemiology of geriatrics

The global and Indian demographic trend shows that, with passage of time, countries have experienced ageing of population with increase in proportion of older persons, thus creating a burden on the working age group. Census 2011, Sample Registration System, and other studies, have shown following demographic changes in India^{1,3-6}.

Proportion of elderly population – 8.2%

Geriatric population growth rate – 1.9%

Old age dependency ratio – 14.2

Physically disabled elderly – 5177/1 lakh.

Age-related physiologic changes and decrease in immunity leads to an increased prevalence of both non-communicable and communicable diseases in the elderly. As per Indian statistics, cardiovascular diseases are responsible for 33% of elderly mortality, respiratory disorders for 10%, infections including TB for 10%, malignancies for 6% and accidents, poisoning and violence for less than 4% with more or less similar rates for nutritional, metabolic, gastrointestinal and genitourinary infections.

Ageing-related problems: Old age is itself associated with various physiological and biochemical changes, which in turn, increase the risk of developing various age-related diseases and morbidities.

A. Medical problems (Table I)

B. Social: Common social problems faced by elderly include:-

- i. Social insecurity

- ii. Financial insecurity
- iii. Sadness (due to poverty, illness, loneliness, etc.)
- iv. Isolation
- v. Elder abuse and neglect

Social problems commonly develop secondary to poor financial status, lack of support from family, illiteracy, unawareness about geriatric welfare services, loneliness^{1,7,14}.

Table I: Common medical problems.

System (prevalence)	Medical problems
Visual ⁸ (25%)	Blindness (5%), cataract
Auditory ⁹ (19%)	Presbycusis, deafness
Locomotor ^{9,10} (25%)	Osteoarthritis, osteoporosis, sarcopenia, gout
Neurological ¹¹ (32 - 80 per 1,000)	Alzheimer's disease, Parkinson's disease, stroke
Cardiovascular ¹² (68%)	Atherosclerosis, hypertension, coronary artery disease, atrial fibrillation.
Respiratory ¹⁰ (10%)	Lower respiratory tract infections, chronic obstructive pulmonary disease.
Skin ¹⁰ (7%)	Dry loose skin, easy bruisability, skin cancer, bed sores
Gastrointestinal ¹⁰ (11%)	Xerostomia, gastroesophageal reflux disease, chronic atrophic gastritis, peptic ulcer, constipation, diverticular disease
Dental ⁷ (29 - 42%)	Dental caries, tooth loss, premalignant/malignant condition
Endocrine ¹⁰ (38%)	Diabetes mellitus, osteomalacia, altered sleep cycle, low cortisol levels.
Genitourinary ¹⁰ (5%)	BPH/prostate cancer, urinary incontinence, atrophic vaginitis, carcinoma cervix/uterus
Haematological	Anemia, reduced immune response, elevated coagulation and fibrinolytic activity.
Psychiatric ¹³ (1 - 25%)	Depression, anxiety, delirium, dementia, suicide

Common geriatric problems

Hypertension

In elderly population, managing hypertension is associated with reduction in risk of cardiovascular events (stroke, heart failure, acute coronary syndrome). Benefits and adverse effects associated with treatment have to be considered in individual patients. Hypotension and postural hypotension are a common problem related with antihypertensive therapy in elderly, especially with comorbidities. HYVET and other studies suggested that in elderly patients with

minimum comorbidities, no postural hypotension and minimal risk of fall and volume depletion, systolic blood pressure can be targeted < 130 mmHg. But in patients with diabetes, heart failure, history of stroke, postural hypotension, systolic blood pressure is targeted < 150 mmHg^{15,16}.

Diabetes

Prevalence of diabetes among elderly is nearly 35%. Decreased lean body mass, increased adiposity, shift of muscle fibre composition to less glycolytic type 1, decreased physical activity, and obesity, contributes to insulin resistance and diabetes. They commonly present with atypical symptoms like confusion, fall, neuropathy, coronary artery disease, visual symptoms, and hyperosmolar coma, instead of common symptoms like polydipsia and polyphagia. Management requires a person-centred approach, considering benefits of glucose control, compliance and education status of patient and treatment related adverse effects. Tight glycaemic control is not advised as they are at higher risk of hypoglycaemia due to reduced oral intake, and declining renal and hepatic function. Elderly, who are otherwise healthy with minimum comorbidities, good cognitive function and functional status have low glycaemic goal with HbA1c < 7.5%. While, elderly people with multiple comorbidities, cognitive impairment or functional dependence have less strict glycaemic goals with HbA1c < 8 - 8.5%¹⁷⁻¹⁹. Irrespective of the therapeutic goal of HbA1c, regular assessment is needed for detection of microvascular complications. Metformin, sodium glucose cotransporter 2 inhibitors, incretin-based therapies are preferred over sulfonylureas and insulin therapies, because the latter agents are associated with high risk of hypoglycaemia and insulin administration needs good cognition, visual and motor skills as well as dependency on caregivers.

Cancer

Cancer is one of the leading causes of mortality among elderly. The GLOBOCAN project has predicted that India's cancer burden will nearly double in the next 20 years, from slightly over a million new cases in 2012 to more than 1.7 million by 2035 with absolute number of cancer deaths rising from 6,80,000 to 1.2 million in the same period. 1.1 million new cancer cases were diagnosed in 2018, with more than 7 million cancer deaths in India only, with more than half of cancer deaths in people above 70 years^{20,21}.

In elderly males, most common cancers are lung, prostate, larynx, oral cavity, oesophagus. In females, most common cancers are breast, followed by cervix and ovary.

High cancer burden in our country is due to expensive treatment, unequal access of cancer care system among

people of different classes, and longevity.

Cognitive impairment

It commonly includes delirium and dementia in elderly population. Normal ageing is associated with mild cognitive impairment, but not sufficient enough to make the patient dysfunctional. These changes may or may not progress to dementia.

Delirium is an acute disorder of disturbed attention that fluctuates with time, along with cognitive change. It is associated with high in-hospital mortality and sometimes with permanent brain damage. It is managed with treatment of precipitating factors (immobilisation, psychoactive drugs, sleep deprivation, visual impairment, hearing impairment, dehydration), supportive care, low-dose haloperidol²².

Prevalence of dementia increase with age. By 85 years of age, 30 - 40% patients develop dementia. By 2015, 47 million people had dementia, and is expected to go above 75 million by 2030⁷. Dementia is decline in cognitive, intellectual and memory function due to involvement of central nervous system without loss of consciousness. Dementia occurs in Alzheimer's disease, multi-infarct state, subdural hematoma, normal pressure hydrocephalus, hypothyroidism, head injury, alcoholism, vitamin B₁₂ deficiency, etc. Alzheimer disease and vascular dementia are the most common causes of dementia in elderly. Treatment includes supportive care, treatment of underlying cause, N-methyl-D-aspartic acid antagonists and cholinesterase inhibitors.

Falls

It is the most common geriatric syndrome. According to the World Health Organisation, 28 - 35% of elderly fall each year globally and prevalence ranges 14 - 53%⁷. Any patient with fall needs evaluation for following underlying cause^{23,24}:-

1. Previous history of fall (66% chance of having another fall within a year).
2. Cardiovascular (arrhythmia, aortic stenosis, heart failure, volume depletion, orthostatic hypotension).
3. Neurological (stroke, Parkinson disease, peripheral neuropathy, lower extremity weakness, cerebellar disease, cervical spondylosis, seizure).
4. Drug induced (antihypertensives, diuretics, beta blockers, sedatives, antidepressants, nitrates, hypoglycaemic drugs).
5. Visual impairment.
6. Labyrinthine disease.
7. Metabolic (hypoglycaemia, dyselectrolytaemia).
8. Foot problems (callus, ulcers, ill-fitting shoes).
9. Urinary incontinence (while rushing to toilet).
10. Environmental hazards (slippery surface, loose rugs).

Falls can be prevented by common practices like, keeping floor dry, bright light, railing/holding bars in bathrooms, good footwear, etc. It is associated with increased risk of hip and wrist fractures, subdural hematoma. Falls can lead to reduced physical activity, social isolation, poor quality of life, depression and subsequent falls.

Polypharmacy

It is defined as prescription of multiple drugs, usually > 5. It commonly arises due to multiple morbidities in elderly. It increases the risk of drug - drug interaction and adverse drug events. Geriatric prescription requires, proper evaluation of all comorbidities, modification in drug dose according to liver and kidney function, starting from minimal drug dose with escalation according to clinical response and managing without drugs as much as possible^{25,26}.

De-prescribing: It is a practice to discontinue drugs, minimally required by the patient. Drugs with lowest benefit harm ratio and lowest chances of adverse drug withdrawal reactions should be deprescribed. E.g., hypotensive agents in patients having postural hypotension, proton pump inhibitors, hypoglycaemic agents in patients with risk of hypoglycaemia.

Urinary incontinence

Nearly 60% of women and 20% of men have some degree of incontinence. Incontinence is of 4 types, including stress type, urge type, incontinence with incomplete bladder emptying and incontinence with impaired physical or cognitive function. It leads to complications like social isolation, depression, skin irritation and falls²⁷. Patients should be evaluated to treat following reversible causes of incontinence:-

1. *Lower urinary tract conditions:* Urinary tract infection, atrophic vaginitis/urethritis.
2. *Increased urinary production:* Hyperglycaemia, hypercalcaemia, excessive fluid intake.
3. *Impaired ability or willingness to reach toilet:* Delirium, chronic illness affecting mobility, depression.
4. *Drug-induced:* Diuretics, calcium channel blockers, gabapentin, alcohol, etc.

Benign prostatic hyperplasia (BPH): It is one of the common causes for urinary incontinence in elderly males, with prevalence of 60% at age 60 and 80% at age 80. A

subset of patients with BPH develop bladder outlet obstruction and associated symptoms like frequency, urgency, hesitancy, straining, dribbling, nocturia, intermittent stream and erectile/ejaculatory dysfunction. The primary goal of treatment is to relieve symptoms and alter disease progression and prevention of complications like acute urinary retention. Digital rectal examination and investigations (serum prostate specific antigen levels, ultrasound and urodynamic study) are needed for diagnosis. Common drugs used to treat obstructive symptoms include alpha-adrenergic antagonists (prazosin, tamsulosin, etc.), beta adrenergic agonists, 5-alpha reductase inhibitors (finasteride), anticholinergics and phosphodiesterase-5 inhibitors (tadalafil). Invasive procedures available for management include transurethral resection of prostate and open simple prostatectomy. It is indicated in presence of acute and/or chronic renal insufficiency, refractory urinary retention, recurrent urinary tract infection, bladder stones or gross hematuria. Other procedures like Holmium Laser Enucleation of the Prostate, Photoselective Vaporisation of the Prostate, Thulium Laser Enucleation of the Prostate are available for people with high risk of bleeding²⁸.

Sleep disorders

Ageing is associated with impaired sleep architecture, with 20 - 40% prevalence in elderly. Sleep disorders commonly seen in geriatric age group include insomnia, sleep disordered breathing due to obstructive sleep apnoea, restless legs syndrome and periodic leg movement in sleep. Insomnia is associated with depression and anxiety.

Non-pharmacological management is the initial approach. It includes avoiding caffeine, alcohol, cigarettes after lunch, limiting liquid intake in evening, maintain regular bedtime and waketime schedule, avoiding naps in daytime. Pharmacological management includes use of benzodiazepines. Drugs should be used as minimum as possible to avoid next day hangover effects^{29,30}.

Elder abuse and neglect

According to WHO⁷ there is prevalence of 2 - 14% for elder abuse and neglect. It is divided in five categories³¹:-

1. Physical abuse: It consists of any act of violence causing pain or injury.
2. Psychological or verbal abuse: Any act like verbal harassment or isolation, that causes mental or emotional distress.
3. Financial abuse: Misusing person's income or resources for personal gain by caregiver.
4. Sexual abuse: It includes sexual assault or coercion.
5. Neglect: It occurs when caregivers don't provide

materials, food and services required for daily essential activities and optimal functioning.

Elderly abuse and neglect can lead to physical injuries, worsening of chronic medical conditions, dehydration, pressure ulcers, emotional distress and loss of income and savings.

Frailty

Frailty refers to inability to bear minor environmental stresses because of ageing associated reduced physiological function of multiple organ systems. Functionally, frailty refers to dependence on others for activities of daily living. It increases the risk of disability, falls and death. Fried *et al*³² defined frailty as a physical condition in the presence of 3 or more of the following 5 components: weight loss, exhaustion, weakness, slowness, and low physical activity. A study by Richard *et al*³³ and a WHO report of 2015 have shown that prevalence of frailty varies between 4 - 17%.

Anorexia/malnutrition/weight loss

Normal ageing is associated with anorexia, leading to malnutrition. It is due to decrease in energy demand, with decreased physical activity, decreased lean body mass. Ageusia, poor stomach compliance, elevated cholecystokinin, low testosterone (in males), and elevated leptin are other factors contributing to anorexia. Malnutrition leads to poor muscle function, decreased bone mass, low immunity, anaemia, poor cognition, delayed wound healing, increased risk of falls.

Osteoporosis

Ageing is associated with progressive decline in bone mineral density and osteoporosis. Risk factors are female gender, advancing age, calcium and vitamin D deficiency, sedentary lifestyle, smoking, alcohol and caffeine excess. Management of osteoporosis requires calcium and vitamin D supplementation, regular walking, muscle strengthening exercises, cessation of smoking and alcohol intake. Sunlight exposure at least 15 minutes a day for three times a week is a good source of vitamin D. The newer drugs, like bisphosphonates are beneficial for osteoporosis.

Sarcopenia

It is characterised by progressive and generalised decrease in skeletal muscle mass and muscle strength with ageing, accompanied by decreasing quality of life and risk of death. Prevalence of sarcopenia between 60 - 70 years is around 5 - 13%. This number increases to around 11 - 50% by age > 80 years. The diagnostic criteria of sarcopenia include decreased muscle mass with decrease in muscle strength/ decreased ability of physical activity. Muscle mass can be

easily measured by bioimpedance analysis or dual energy X-ray absorptiometry, while CT/MRI is the gold standard procedure for this. Muscle strength is commonly assessed with handgrip strength. Short physical performance battery test is a standard test for assessing physical performance³⁴.

The two main components of management of sarcopenia include exercise and physical activity (progressive resistance training) and high protein content in diet (1 - 1.5 gram/kg body weight/day) to improve muscle mass and strength. Angiotensin Converting Enzyme Inhibitors have been found useful in sarcopenia in various studies. These drugs provide beneficial effects by improving endothelial function, angiogenesis and anti-inflammatory effect.

Constipation

Prevalence of constipation in the general population ranges from 2% to 27% and 33% in elderly. Constipation is defined by using a combination of objective (stool frequency, manual manoeuvres needed for defecation) and subjective (straining, lumpy or hard stools, incomplete evacuation, sensation of anorectal obstruction) symptoms in ROME III criteria. Various physiological changes in elderly like delayed colonic transit time, decreased colonic propagating contractions, decreased rectal sensation and compliance, atrophy of internal and external anal sphincter contribute to constipation. It is associated with various medical conditions in elderly (e.g., diabetes, hypothyroidism, chronic kidney disease, hypokalaemia, hypercalcaemia, Parkinson disease, dementia, autonomic neuropathy, depression, etc.) and drugs (e.g., analgesics, calcium channel blockers, diuretics, iron supplements, antiepileptics, etc.). Patients commonly present with decreased bowel frequency, altered consistency, excessive straining, rectal or vaginal digitation for stool expulsion and sensation of incomplete evacuation. Severe constipation can lead to secondary changes causing dyspepsia, abdominal cramping, bloating, flatulence, heartburn, nausea, and vomiting. Constipation is associated with psychological impairment and social distress³⁵.

Diagnostic evaluation requires detailed history for causative factors with physical examination including perianal and digital rectal examination. Pelvic floor evaluation is done by Anorectal manometry and balloon expulsion. Colonic transit is assessed by radiopaque markers, colonic scintigraphy, and wireless motility capsule.

Treatment consists of fiber supplementation as initial approach. Patients not responding to this can be advanced to osmotic laxatives (magnesium salts, lactulose and sorbitol). Stimulant laxatives (bisacodyl and senna) and secretagogues (lubiprostone and linaclotide) are reserved

for patients who are refractory to fiber supplements or osmotic laxatives. Pelvic floor rehabilitation is the treatment of choice for pelvic floor dysfunction. It includes educating patients about pelvic dysfunction, co-ordinating increased intra-abdominal pressure with pelvic floor muscles relaxation during evacuation, and practicing simulated defecation with a balloon. Rarely surgery is indicated, where, subtotal colectomy with ileorectal anastomosis is the treatment of choice for refractory slow transit constipation in cases when pelvic floor dysfunction is excluded. Alternative therapies include sacral nerve stimulation and botulinum toxin injection therapy for pelvic floor dysfunction.

Preventive measures for elderly

A. Screening

Screening of elderly patients can be done in outpatient department, with basic questions, on routine basis for early detection of functional limitations, social problems, cognitive disorders and geriatric syndromes⁷. Any abnormality detected on screening requires further assessment with other scales and tests, e.g. Depression scales, mental status examinations, etc.

B. Screening test for specific disease

Screening tests have been advised by various committees for screening of elderly population to identify those, at risk of developing specific diseases⁷ (Table II).

C. Vaccination

Elderly population is at higher risk of acquiring pneumococcal infection, influenza, and shingles. Centre for Disease Control and prevention has recommended following vaccines for elderly population:-

1. *Influenza* – recombinant or inactivated influenza vaccine, single dose given annually.
2. *Tetanus, diphtheria, pertussis*:-
 - a. If previously Tdap was not received at or after 11 years of age, single dose of Tdap vaccine followed by Td booster every 10 yearly is advised.
 - b. If primary vaccination is not received, then 1 dose of Tdap given followed by 1 dose of Td after 4 weeks and then 2nd dose of Td 6 - 12 months later. This is followed by Td booster, 10 yearly.
3. *Zoster* – for population ≥ 50 years of age, 2 doses of recombinant zoster vaccine advised, 2 - 6 months apart. It is given irrespective of previous zoster or previously received zoster vaccine.

Table II: Primary prevention screening for specific diseases in elderly.

Type of screening	Screening test	Frequency	Recommendation
Colorectal cancer	Fecal occult blood Sigmoidoscopy or colonoscopy	Annually 10 yearly	Screen all adults > 50 years. Discontinue screening, if comorbidities preclude treatment
Breast	mammography	1 - 2 yearly	Annual screening starting at age 40 year
Cervical	HPV + PAP test	5 yearly	Screen women in age of 21 - 65 years. Discontinue at age 65, if screening gives negative results
Lung	Low dose CT scan	Annual	Screen 55-74-year-old current or former smoker, with > 30 pack year history
Prostate	PSA	1 - 2 yearly	Biennial screening in 55-69-year old with life expectancy > 10 - 15 years
Diabetes	Fasting blood glucose, glucose tolerance test, or HbA1c	Annually	Screen people > 45 years

4. *Pneumococcus* – pneumococcal 13 valent conjugate vaccine (PCV 13) and pneumococcal 23 valent polysaccharide vaccine (PPSV 23) are recommended.
- For immunocompetent people > 65 years, 1 dose of PCV13 followed by 1 dose of PPSV 23 at least 1 year after PCV13 dose and 5 years after last dose of PPSV 23.
 - If patient has previously received PPSV 23, but not PCV 13, then 1 dose of PCV 13 given at least 1 year after PPSV 23 dose.
 - For patients with chronic heart condition (excluding hypertension), chronic lung or liver disease, diabetes, chronic alcoholic or smoker, 1 dose of PPSV 23 advised.
 - For patients > 65 years age with HIV infection, chronic renal failure, leukaemia/lymphoma, post-organ transplant, hyposplenism, CSF leak, cochlear implant, who are previously vaccinated with PCV 13 and PPSV 23, single dose of PPSV 23 recommended at least 5 years after last dose of PPSV 23.

Health policies and programmes for elderly

Various health policies and programmes have been implemented over time for benefit of elderly, to address their medical, psychological, social and financial problems. Following are some major programmes:-

A. Integrated programme for older persons

Implemented in 1992 with the objective of improving the quality of life of elderly by providing basic amenities like shelter, food, medical care, etc., through support from Government/ Non-Governmental Organisations/Panchayati Raj Institutions/local bodies, etc. Projects being assisted under this scheme includes:

- Maintenance of Old Age Homes
- Multi Service Centres for Older Persons and widows
- Mobile Medicare Unit;
- Day Care Centre for Old Person with Dementia;
- Physiotherapy Clinics;
- Regional Resource and Training Centres;
- Helplines and Counselling for Older Persons.
- Awareness Projects for Older Persons;
- Formation of Vridha Sanghas/Senior Citizen Associations/Self Help Groups;

B. National policy on older persons

Started in January 1999, the policy consists of State support to ensure financial and food security, health care, shelter and other needs of older persons, equitable share in development, protection against abuse and exploitation, and availability of services to improve the quality of their lives. Special focus is on elderly women to protect them from being victimised due to their age, gender, and widowhood. Following schemes are included under this policy:-

- Establishing geriatric ward for elderly patients at all district level hospitals.
- Expansion of treatment facilities for chronic, terminal and degenerative diseases.
- Providing Improved medical facilities to those not able to attend medical centres – strengthening of Community Health Centres/Primary Health Centres/ Mobile Clinics.
- Inclusion of geriatric care in the syllabus of medical courses, including courses for nurses.
- Reservation of beds for elderly in public hospitals.
- Training of Geriatric Care Givers.
- Setting up research institutes for chronic elderly diseases such as Dementia and Alzheimer.

C. Indira Gandhi National Old Age Pension Scheme

Under this scheme, central assistance is provided towards pension of Rs. 200/- per month to persons above 60 years

and of Rs. 500/- per month to persons above 80 years belonging to a household below poverty line, and supplemented by at least an equal contribution by the states.

D. National programme for the health care of the elderly

Implemented in 2011 with the objective of providing accessible, affordable, and high-quality long-term, comprehensive and dedicated care services to the ageing population and to promote the concept of Active and Healthy Ageing. Strategies under this programme include:-

1. Community based primary health care approach including domiciliary visits by trained health care workers.
2. Dedicated services at Primary Health Centre/ Community Health Centre level including provision of machinery, equipment, training, additional human resources, etc.
3. Dedicated facilities at District Hospital with 10 bedded wards, additional human resources, machinery and equipment, consumables and drugs, training.
4. Strengthening of 8 Regional Medical Institutes to provide dedicated tertiary level medical facilities for the Elderly, introducing post-graduate courses in Geriatric Medicine, and in-service training of health personnel at all levels.
5. Information, Education and Communication using mass media, folk media and other communication channels to reach out to the target community.
6. Continuous monitoring and independent evaluation of the Programme and research in Geriatrics.

Gaps in geriatric health care

Following are some gaps and deficits present in geriatric health care, which need to be addressed:-

- a. Vaccination for older people not included in national immunisation program.
- b. Availability of mobile health-care units and physiotherapy services.
- c. Separate facilities and palliative care homes for elderly with severe functional or cognitive impairment.
- d. Day-care centres, which can be used for group exercises, to provide nutritious meals, for recreational activities, development of new hobbies and for income generating activities.
- e. Help from NGOs and private health care institutions needed to cater to increasing elderly population.

- f. Programs related to elderly, usually don't take into account, the family or the caregiver.
- g. The coverage and utilisation of health care services in India vary with states. There is a huge gap between rural and urban India in terms of knowledge and practice, socio-economic conditions, and epidemiology of diseases. Rural population, in addition suffer from poor availability and accessibility of geriatric health centres. Health policies and programmes need modification to specially cater to the rural population. Also, each state, should come up with a plan regarding elderly care which is suitable and applicable in their respective areas.

Conclusion

- A. Ageing, itself is not a disease. It is associated with physiological changes that increase susceptibility to diseases. It is commonly associated with variation in laboratory parameters, which may not always reflect some pathology.
- B. They usually have multiple problems together at same time and medical conditions are usually multifactorial in origin.
- C. Cognitive disorders and potentially reversible and treatable conditions like, fall, urinary incontinence, elder neglect should be detected and managed early.
- D. Iatrogenic illnesses are common in elderly, commonly due to adverse drug reactions and immobility.
- E. Major goals of care include functional ability and quality of life before cure.
- F. Inter-professional collaboration is needed among different professionals for effective care.
- G. Geriatric care is largely provided outside hospital – at home or in skilled nursing and assisted living settings.

References

1. Khan S, Itrat M. Current Issues in Geriatric Health Care in India-A Review. *J Comm Med Health Care* 2016; 1 (1): 1003-6.
2. Adhikari P. Geriatric health care in India - Unmet needs and the way forward. *Arch Med Health Sci* 2017; 5: 112-4.
3. Census of India Website: Office of the Registrar General and Census Commissioner, India. [Censusindia.gov.in](http://www.censusindia.gov.in). 2019. Available from: <http://www.censusindia.gov.in/2011-Common/CensusData2011.html>.
4. Census of India Website: Office of the Registrar General and Census Commissioner, India. [Censusindia.gov.in](http://www.censusindia.gov.in). 2019. Available from: http://www.censusindia.gov.in/2011-Common/Sample_Registration_System.html.
5. Paul NS, Asirvatham M. Geriatric health policy in India: The need for scaling-up implementation. *J Fam Med Prim Care* 2016; 5: 242-7.

6. Nath A, Ingle G. Geriatric health in India: Concerns and solutions. *Ind J Comm Med* 2008; 33 (4): 214-9.
7. World report on ageing and health. World Health Organisation. 2019. Available from: <https://www.who.int/ageing/publications/world-report-2015/en/>
8. Malhotra S, Vashist P, Kalaivani M *et al.* Prevalence and causes of visual impairment amongst older adults in a rural area of North India: a cross-sectional study. *BMJ Open* 2018; 8 (3): 1-9.
9. Velayutham B, Kangusamy B, Joshua V *et al.* The prevalence of disability in elderly in India – Analysis of 2011 census data. *Disability and Health J* 2016; 9 (4): 584-92.
10. Shraddha K, Prashantha B, Prakash B. Study on morbidity pattern among elderly in urban population of Mysore, Karnataka, India. *Int J Med Bio Res* 2012; 1 (3): 215-23.
11. Das SK, Biswas A, Roy J *et al.* Prevalence of major neurological disorders among geriatric population in the metropolitan city of Kolkata. *JAPI* 2008; 56: 175-81.
12. Mozaffarian D, Benjamin EJ, Go AS *et al.* On behalf of the American Heart Association Statistics Committee and Stroke Statistics Subcommittee. Heart disease and stroke statistics – 2016 update: a report from the American Heart Association. *Circulation* 2016; 133 (4): e38-e360.
13. Andreas S, Schulz H, Volkert J *et al.* Prevalence of mental disorders in elderly people: The European MentDis_ICF65+ study. *Br J Psych* 2017; 210 (2): 125-31.
14. Lena A, Ashok K, Padma M *et al.* Health and social problems of the elderly: A cross-sectional study in Udupi Taluk, Karnataka. *Ind J Comm Med* 2009; 34 (2): 131-4.
15. De Vries TI, Peters R, Beckett NS *et al.* Estimating individual cardiovascular disease risk reduction by blood pressure lowering in elderly patients: results from HYVET study. *Eur Heart J* 2018; 39: 9.
16. Nilsson P. Blood pressure strategies and goals in elderly patients with hypertension. *Experimental Gerontol* 2017; 87: 151-2.
17. Sumantri S, Setiati S, Dewiasty E. relationship between metformin and frailty syndrome in elderly people with type 2 diabetes. *Acta Medica Indonesia* 2014; 46 (3): 183-8.
18. Avogaro A, Dardano A, de Kreutzenberg S *et al.* Dipeptidyl peptidase-4 inhibitors can minimise the hypoglycaemic burden and enhance safety in elderly people with diabetes. *Diabetes, Obes Metabol* 2014; 17 (2): 107-15.
19. Kalyani R, Golden S, Cefalu W. Diabetes and Aging: Unique Considerations and Goals of Care. *Diabetes Care* 2017; 40 (4): 440-3.
20. Globocan 2018: India factsheet - India Against Cancer. India Against Cancer. 2019. Available from: <http://cancerindia.org/in/globocan-2018-india-factsheet>.
21. Mallath M, Taylor D, Badwe R *et al.* The growing burden of cancer in India: epidemiology and social context. *The Lancet Oncology* 2014; 15 (6): e205-12.
22. Hsu C, Best J, Davis J *et al.* Aerobic exercise promotes executive functions and impacts functional neural activity among older adults with vascular cognitive impairment. *Br J Sports Med* 2017; 52 (3): 184-91.
23. Dhargave P, Sendhilkumar R. Prevalence of risk factors for falls among elderly people living in long-term care homes. *J Clin Gerontol Geriatrics* 2016; 7 (3): 99-103.
24. Vieira E, Palmer R, Chaves P. Prevention of falls in older people living in the community. *BMJ* 2016; i: 1419.
25. Morin L, Johnell K, Laroche M *et al.* The epidemiology of polypharmacy in older adults: register-based prospective cohort study. *Clin Epidemiol* 2018; 10: 289-98.
26. American Geriatrics Society 2019 Updated AGS Beers Criteria® for Potentially Inappropriate Medication Use in Older Adults. *J Am Geriatrics Soc* 2019; 67 (4): 674-94.
27. Shaw C, Wagg A. Urinary incontinence in older adults. *Medicine* 2017; 45 (1): 23-7.
28. Benign Prostatic Hyperplasia (BPH) Guideline - American Urological Association [Internet]. Auanet.org. 2019. Available from: [https://www.auanet.org/guidelines/benign-prostatic-hyperplasia-\(bph\)-guideline#x8216](https://www.auanet.org/guidelines/benign-prostatic-hyperplasia-(bph)-guideline#x8216).
29. Srinivasan S, Rudd K, Laiwala R *et al.* Managing Sleep in Older Adults with Neurocognitive Disorder: Non-Pharmacologic Approaches Across the Care Continuum. *Am J Geriatric Psych* 2018; 26 (3): S36.
30. Miner B, Kryger M. Sleep in the Aging Population. *Sleep Medicine Clinics* 2017; 12 (1): 31-8.
31. Burnes D, Pillemer K, Caccamise P *et al.* Prevalence of and Risk Factors for Elder Abuse and Neglect in the Community: A Population-Based Study. *J Am Geriatrics Soc* 2015; 63 (9): 1906-12.
32. Fried LP, Tangen CM, Walston J *et al.* Cardiovascular Health Study Collaborative Research Group. Frailty in older adults: evidence for a phenotype. *J Gerontol A Biol Sci Med Sci* 2001; 56 (3): M146-56.
33. Ofori-Asenso R, Chin K, Mazidi M *et al.* Global Incidence of Frailty and Prefrailty Among Community-Dwelling Older Adults. *JAMA Network Open* 2019; 2 (8): e198398.
34. Aryana I, Kuswardhani R. Sarcopenia in Elderly. *Int J Geriatrics Gerontol* 2018; 2018 (01): 1-4.
35. Roque MV, Bouras EP. Epidemiology and management of chronic constipation in elderly patients. *Clin Interventions Aging* 2015; 10: 919-30.