Nursing and Interdisciplinary Sciences

- **Evolution of geriatric nursing**

Jasbir Kaur

Principal, College of Nursing, DMC, Ludhiana, Punjab

The origins of gerontological nursing began when Florence Nightingale, the founder of modern nursing, accepted a position as superintendent in the Institution for the care of sick women in distressed circumstances. Awareness of the need for education in gerontological nursing , as well as the need for improvement in care for institutionalized older adults was first noted in the American nursing literature in the early 1900s. An editorial in the American Journal of Nursing in 1952 called for nurses to consider a specialty in the nursing care of the aged. Again, in 1943, the an article describing the nursing care of the aged recommended that nurses with special aptitude care for the aged and that nursing and medical schools include geriatric education (Geldbach, 1943). The first book on gerontological nursing was written by Newton and Anderson in 1950.

The American Nurses Association (ANA) recommends the formation of geriatric nursing speciality. The ANA convened its first focus group on gerontological nursing in 1962. The first Division of Geriatric Nursing Practice was established within the ANA in 1966. In 1968, the Geriatric Division of the ANA published the first geriatric nursing standards for practice. In 1975, the ANA certified the first nurses in gerontological nursing.

Since then there has been substantial shifts in health policy and funding to help shape geriatric nursing education, research, and practice.

- **Training in the Gerontological nursing**

Manju Vatsa

Principal, College of Nursing, AIIMS, Delhi

In 1966, Duke University started the first gerontological master's program. Advanced practice geriatric nurses are registered nurses who have completed a master's program to specialize as geriatric nurse practitioners, geriatric nurse clinical specialists, and gero-psychiatric nurses. These advanced practice geriatric nurses work in collaboration with geriatric physicians and social workers to render care to older adults and serve as faculty to prepare increasingly large numbers of geriatric nurses. In India virtually all nurses in the course of their careers care for older adults: providing preventive and wellness programs; helping patients manage multiple chronic conditions and deal with increased mental and physical frailty; and facilitating a peaceful death. It is, therefore, imperative that these nurses have basic competence to deliver care to older adults.

To date, there have been three initiatives to ensure geriatric competency in nurses. The first is to ensure geriatric competency in all students who graduate from a basic nursing courses as Geriatric nursing is included in the basic nursing courses since 2007, though most still may not get practical training exclusively in geriatric wards even today.

The second initiative, which is now developing, involves preparing all practicing nurses with competency in geriatrics by way of developing learning modules in Geriatric nursing which were developed by initiatives taken by department of Geriatrics and College of Nursing at AIIMS with the funding provided by WHO in a effort to provide ready-made materials for use and to create or supporting geriatric focus groups or special interest group that allows for formalizing a sustained interest in geriatrics.

During past 6 years, the profession has slowly embraced a strategy for all nurses with geriatric competencies as a way to ensure that older adults experience appropriate nursing care, and the third initiative is development of curricula for post-graduate nurse, for preparing advance practice nurse in Gerontological nursing.

There is urgent need to establish of Centers for Geriatric Nursing Excellence and programs to support pre- and postdoctoral fellowships in geriatric nursing in ensuring a “pipeline” of well-prepared academic nurses who can sustain programs of geriatric research and educate the next generation of geriatric nursing leaders.

- **Professional Competencies required for Nursing Practice in Gerentological Nursing**

Sandhya Gupta

College of Nursing, AIIMS, New Delhi

Nurses need to have basic competencies in incorporated in geriatric-focused nursing content and learning opportunities into the basic nursing curriculum, including both the didactic and clinical experiences to ensure that nursing students are able to provide the necessary geriatric care for the nation's aging population.

These competencies focus on the unique practice knowledge, skills, and attitudes of the adult-gerontology nurse. 1) Communication for older adults, use communication strategies to meet patients' needs, assure participation in decision making: advance directives, health care proxy, DNR, informed consent, assess barriers that impact self evaluation of competencies, 2) Physiological and Psychological age-changes: for older adults, demonstrate best practices in order to: Intervene to address changes in temperature, BUN and creatinine, assess cognitive status for delirium, dementia and/or depression. Use standardized scale, assist in diagnostic or therapeutic procedures, prevent nosocomial infections or environmental stressors, 3) Pain: demonstrate skill to assess & manage pain in cognitively intact older patients and impaired patients, 4). Skin Integrity: demonstrate best practices to assess the risk of skin breakdown using a standardized scale and implement appropriate bathing, choice of skin products, and positioning etc, 5) Functional Status for older adults: demonstrate best practices to: promote function in response to change in activities of daily living (ADL) and instrumental activities of daily living (IADL), use assistive devices to promote and maintain optimal function, rational for use of indwelling catheters, monitored acutely ill patients, use criteria to Intervene to address barriers to nutritional/fluid adequacy, inability to self feed, use a measure of fall risk assessment use the falls prevention protocol, 6) Restraints: demonstrate best practices in order to use a physical restrain and intervene to eliminate the use of physical restraints, 7) Elder Abuse: demonstrate best practices in order to identify elder abuse and 8) Discjharge planning: demonstrate timely and complete information to patient/family, home care skilled nursing and provide patient education materials, for health promotion. In 2010-curriculum of the ger-clinical speciality are clinical care, administration, education and community health focusing: family/individual across the lifespan, adult-gerontology, women's health/gender-related, or psych/mental health.

- **Research Issues in Geriatric Nursing**

Arunjyoti Baruah

Associate Professor, LGB Regional Institute of Mental Health, Tezpur, Assam

Health and care of older persons is a matter of great concerned for developed and developing countries alike. Nursing Research in this group of people is limited. Issues inflicting set back in geriatric research needs to be deliberated. There are very few scientific evidences to work with this vulnerable group. Many complex emerging issues on geriatric nursing care, challenges and methodological concern are involved in geriatric nursing researches.

Some of the emerging research issues to improve the quality of nursing care for Geriatric population are:

Community Research: Communicable disease prevention, Quality of life issues, Life style management, Home based geriatric care, Elderly abuse and neglect, Techno assisted nursing care, Rehabilitation issues and Family issues.

Clinical research: Nursing care needs of various chronic conditions & neuro- degenerative disorders, Age specific care protocol, Advance directives, Medications, Infection control, ADL, Patient safety and Mental health problems

Policy research: Geriatric friendly care environment, Health cost, Staff with adequate training, Evidenced based care protocol, Carrier in geriatric nursing, Culture specific training module, financial insufficiency and Issues related to legal safeguard.

Some of the procedural limitations in conducting research in geriatric nursing: Various factors related to old age have imposed some limitations, which needs to be considered carefully while conducting research in geriatric nursing. Ethical issues: Informed consent, competence, Privacy, Complex conceptual model of care, Lack of appropriate tools for geriatric population, Data collection procedure: Time consuming, complex nature of sample requirement, inadequate data related to memory issue, confusion, functional impairment, transference, recall bias, drop out, incomplete earlier life history in person living in elderly care home etc are some issues related to data collection.

Research productivity is one of the most impressive outcomes of geriatric nursing during the past 20 years. Often beginning with small qualitative studies, and substantially bolstered by funding from the National Institute for Nursing Research and the National Institute on Aging, geriatric nursing has made substantial contributions to improved patient care and to policy decisions that influence the structure in which care is delivered.

Geriatric nursing research has been influential in changing the paradigm for the use of physical restraints in nursing homes and hospitals, improving the assessment and management of pressure ulcers, pioneering improvements in assessment and management of urinary incontinence and ensuring appropriate end-of-life care. Nursing research has been instrumental in identifying outcomes associated with evolving models of geriatric care.

There is good evidence that, in the future, geriatric nursing will be a force for continued improvements in care to older adults during the next decade. Continued support from the National Institutes of Health will be crucial if geriatric research is to continue to grow and flourish.

Conclusion: Thoughtful researches in geriatric nursing will mitigate the challenges in providing quality nursing care for this group and will create a newer dimension of nursing.

- **Tools Used for the Assessment of Older Persons**

Harmeet Kaur Kang

Principal, CSHS, Chitkara University, Punjab

Older persons could any time become dependent on other persons due to their reduced mobility & debilitating disabilities and to fulfill their caring needs, skilled nursing personnel are required to take care of this segment of population. The comprehensive assessment of older adults is imperative to provide interventions on time so that future disabilities can be prevented. Comprehensive assessment includes physical, cognitive, psychological and social aspects of health of older adults. The assessment of older persons is multidimensional; it includes the assessment of functional capabilities, immobility, fall risk, nutrition, oral health, depression, dementia, sensory perception, pain and urinary incontinences etc. Any single tool may not provide the data for comprehensive assessment of older adults. There is need for compilation of different assessment tools based on the needs of individual older person. Along with general health assessment, five I's of older adults' assessment should be taken into account: Intellectual impairment; Immobility; Instability; Incontinence; Iatrogenic disorders. It has to be taken care that older adults assessment should be flexible in scope and should be best suited for elders with multiple medical problems and significant functional limitations.

Now a days, many tools which are patients driven instruments having questionnaire on their symptoms, activities and abilities etc. are available which can provide information regarding their cognitive ability and motivation. The wide range of geriatric assessment tools have been developed, few of these to name; Index of Independence of activities of daily living (Katz & Straoud), Barthel Index of activities of daily living, Clifton Assessment Procedure for Elderly, Fulmer SPICES, Hearing Handicap Inventory for the Elderly and Mini-Cognitive Assessment Instrument, Geriatric Mental Health State Schedule, Mini Mental Status Examination (MMSE) etc., Use of the CAGE as a formal screening tool for use of alcohol by older patients. Nurses need to especially learn use of assessment tools.

- **Assessment of Older Person**

Sumity Arora

Faculty, HF College of Nursing, Delhi

The geriatric assessment is a multidimensional, multidisciplinary diagnostic instrument designed to collect data on the medical, psychosocial and functional capabilities and limitations of elderly patients. It will drive the diagnostic process and clinical decision making and screen for preventable diseases, functional impairments that may result in physical disability and amenable to intervention. One can expect the examination of an elderly patient to take longer than usual, because communication may be difficult and symptoms obscure.

Assessment in elderly can be conducted at three levels: the basic level which looks at functional activities and personal care, the instrumental or intermediate level which is concerned with tasks of moderate complexity, such as shopping, doing the laundry, self medications and the third level of advanced activities of daily living, for example, the occupational or recreational activities of the older person. In History taking process interviewer have to be flexible and start from identification data. Present Illness in which the purpose is to identify the major presenting

symptom as well as persistence, change, severity, character, resolution and disabling effects of initial symptoms. Past history includes chronological list of medical diseases like hypertension, diabetes, CAD, asthma etc, injuries and surgical operations or any implants, Allergies, including clinical description of exposure, Medications, including dosage, duration and indication and diet (nutrition). After that nurse collect Social history, which includes Vocation and Education, Recreational, Activity, Exercise, Sleep, Sexual Activity, Substance Use, Living Arrangements and Services, Security, Social Network, Financial Security, Transportation. Basic nursing care assessment include assessing the patients' Functional Status as daily routine to assess the personal hygiene, Grooming, Vitals, Positioning, fall, cognition, mood disorders, Use or Potential Use of Adaptive and Assistive Devices.

- **Social issues in Gerontological Nursing**

Vijaya Puthusseril

Professor and Chief Training Coordinator, Charity World Trust, Changanacherry, Kerala

The scope of gerontological nursing practice, involves assessing the social aspects of health and functional status of older adults and providing appropriate nursing and other health care services, evaluating the effectiveness of such care. Emphasis is placed on maximizing the functional ability in the activities of daily living; promoting, maintaining and restoring health, including mental health; preventing and minimizing the disabilities of acute and chronic illness; and maintaining life in dignity and comfort until death. Gerontological nursing may be practiced in any setting, for example, the nursing home, the hospital, the clients home, the clinic and the community. Gerontological nursing focuses on the client and family in the societal context in addition to traditional nursing care responsibilities, as changes are evolving for example, nurses can initiate and develop innovative ways of addressing responsibilities regarding health promotion. Any of the following can become settings for gerontological nursing: day hospitals, senior centers, respite programs, congregate housing, private nursing practices, gero-psychiatic programs, rehabilitation program, assisted living facilities, group meal programs, adult day care centers, community offices on ageing, protective service agencies and inpatient or outpatient geriatric assessment programs. It has become increasingly common for gerontological nurses to work in collegial relationships other members of a multidisciplinary team including physicians, psychiatrists, social workers, physical therapists and other health care providers.

- **Challenges and Scope of Geriatric Nursing Practice: An Experience from Chandigarh**

Sukhpal Kaur

NINE, PGIMER, Chandigarh

Elderly are the most frequent users of services in all the health care settings. A large number of their health related problems (e.g. stroke) are such that they don't need stay in the hospital, but can be taken care of either at the long term care facilities or at their homes where the care is primarily provided by the untrained informal caregivers. However, trained nurses could be of utmost importance but we have very few such long stay homes or community settings. Hence the nurses need to take any independent role and utilize their skills, there is a strong need of trained nurses to work liaison with specialists and super specialists as a team.. There is a strong need of data generation from society to understand the real time issues and challenges being faced by the societies which trained nurses can very well do.

Certain community based interventions for the care of elderly have been tried in PGIMER Chandigarh with the financial support from ICMR and DST, GOI and 'Elderly care module' was developed.

In one more study the effect of training of caregivers on the prevention and management of bedsores and also on certain other outcome variables like quality of life, degree of satisfaction, the co-morbidities experienced by the patients were studied. There was a significant impact of both the packages in the prevention and reduction of bedsores in both the groups. Majority of the caregivers expressed a desire to be formally trained in care-giving through use of booklets or audio-visual aids. So, we were able to generate data and evidences of involvement of the nurses in providing quality care to the elderly by training the caregivers keeping in mind the constraints of elderly care facilities in the Indian settings.

- **Home Health for Older Persons**

Sandhya Gupta*, Manju Dhandapani, Aditi Sinha* and ***Shilpi Sarkar,**

Faculty, College of Nursing, AIIMS, New Delhi,NINE, PGIMER and ***Shilpi Sarkar, College of Nursing, Jamia Hamdard University, New Delhi*

The proportion of older people is rising in India and globally due to better healthcare services at primary, secondary and tertiary preventive level, proportion of older people in India population will rise thus more people will require home care of for older person and family caregivers would require more training and assistance. Due to early discharge of patients for any of the medical problems from hospitals after acute care management, family members become responsible for taking care of not only healthy, but also recovering older person people who are most of the time their parents or grant parents.

It is well evident that care-giving to older person is a challenging task as they undergo various physical, cognitive, emotional and behavioral changes which affects their physical and mental health thus leading to dysfunction in personal and social life. They also phase challenges like risk for fall, suicidal ideation, communication difficulties, sleep disorders, loss of independence and elder-abuse. A range of health and supportive care are provided to the older adults by the formal or voluntary caregivers. Ensuring that all their needs are taken care of in terms of their health and well-being can be quite complex and cannot be done without adequate help or support. If invalid, the important steps in care include basic needs and personal care such as hygiene, nutrition, mobilization and elimination which can be provided by the family caregivers. If sick they may require skilled nursing care such as monitoring of vital parameters, nursing interventions like injections, dressings, intermittent catheterization, physiotherapy, speech therapy etc which can be provided by home health nurse. Other care strategies for older person at home include cognitive-behavioral therapy to maintain their mental hygiene and safety measures to prevent fall. It is also evident that caregivers of older person also need support to develop positive attitude towards caring older person. A well planned home care helps older adults to live independently for as long as possible, even with an illness or injury.

- **Institutionalized Care of Older persons**

Sandhya Gupta*, Raminder Kalra, Ms Renju Sussan B*** and Shanu Mehana***

**Faculty, College of Nursing, AIIMS, **Principal, HF College of Nursing, Delhi and ***Faculty, MOSC College of Nursing, Kerala, ****Faculty, SJH College of Nursing, Delhi*

Institutionalized care elderly care in India is still in the beginning stage, the concept of 'retirement communities' first came up in the south Indian states of Kerala, Tamil Nadu, West Bengal, Pune, Andhra Pradesh and now all over India. The old age homes are meant for senior citizens who are unable to stay with their families or are destitute. There are several types of institutionalized care can be through Old age homes, Long stay homes , Dependency Units, Hospice care and Hospice care.

The entire perspective of the senior care as confined to old age homes has now changed. They are no more for the destitute and run for charity. Mostly the elderly left in a stand-alone mode are from middle and upper middle class family. This has led to a new direction of thoughts of setting a retirement community which will be homelike. In fact several investors are putting in their time and money into making this into reality. The elderly can enjoy similar lifestyle outside of their homes in addition to taking care of household services and medical emergencies. It also favours seniors with an option to spend the rest of their lives with like-minded people from the same age-group and income-group. Most importantly a caregiver facility is offered which permits admission of disabled, bedridden and those with health concerns. One can now see the increasing number of seniors demanding independent living rather than living as dependents to their children.

However, the needs of all of the senior citizens may not have met in institutions and are maintained with the special requirements of senior citizens – grab rails, anti-skid tiles, wheelchair-friendly premises and many more. Also facilities like social and spiritual events, restaurants, libraries and residents are kept busy and active with regular activities like satsang, cinema, tambola, cultural events and festivals. There are more than three thousand institutions in India. Most of them offer free accommodation. Some homes work on a payment basis depending on the type and quality of services offered. Apart from food, shelter and medical amenities, old age homes also provide yoga classes to senior citizens, old age homes provide a safe haven and also create a family like atmosphere among the residents. Senior citizens experience a sense of security and friendship when they share their joys and sorrows with each other. Whereas for emergency purpose in long stay homes each unit is equipped with emergency switches and there are medical personnel in the complex in long stay homes can expect much more nursing and personal care here than one would typically receive in a retirement home or old age homes, other professionals who may be able to help include doctors or nurses, police officers, lawyers, and social workers.

- **Innovative Strategies for Advocacy for the Cause of the Elderly**

Bijoy Basant Patro

Director, One World Foundation India, New Delhi

The matter pertaining to 'Innovative Strategies for Advocacy for the Cause of the Elderly' aims to answer two problem questions, each of primacy. The first is how can advocacy towards evidence-based policy making processes help the cause of the elderly population in the country. The second, and more important question is how can advocacy initiatives be moulded into a strategy to achieve enhanced standards of geriatric health and care.

A part of the answer is the search for evidence-based policy making processes that can help advocate for elderly-friendly policies and entitlementsin the country. This is firstly possible by ensuring that the body of research findings on the subject have been compiled to lead policy makers and decision influencers towards demonstrable action.

The accompanying approach is to undertake an analysis of existing processes and examples (good practices) and identify elements (that can be generalised to suit the policy-making ecosystem in a country as diverse as India) that work towards underlining and facilitating valid entitlements for the country's elderly population.

While an advocacy strategy for the elderly will necessarily be driven by the same compass as advocacy for other sections of the community do, yet, it will also underline the demand of autonomy which is essential for achieving dignity for an elderly population. This is one area where efforts towards outlining an advocacy strategy for elderly will also have much to learn from (besides working in tandem with) advocacy initiatives in the field of disability.

Advocacy needs to be complemented by persuasive communication and lobbying to influence (in a positive way) decision and policy makers. In that sense, an advocacy strategy encompasses a media strategy.

Innovations in this direction will, therefore, work best with creative and innovative use of media to reach the information contained in the various research outputs and evidences that can inform policy making for elderly care in India.

- **Prevalence of Abuse and Mistreatment of older persons in Uttara Khand, India**

Muthuvenkatachalam S* and Dr Sandhya Gupta**

**Pal College of Nursing, Uttarakhand and **College of Nursing AIIMS New Delhi*

Background: Abuse against the older person is recognized as an important challenge to elderly health. World Health Organization (WHO, 2002) defines elder abuse as "a single or repeated acts, or lack of appropriate action, occurring within a relationship where there is an expectation of trust, which causes harm or distress to an older person".

Aim: The Aim of the study is to find out Prevalence of Mistreatment of Older Persons in a selected population of North India and to find out its correlates.

Methods of Data collection: Cross-sectional survey design opted for the study, Sample: 381 Older persons of 60 years or older, Research setting: Data for the present study was collected Uttarakhand state.Tools : The MOS Social Support Survey (MOS-SSS), Hwalek-Sengstock Elder Abuse Screening Test (H-S/EAST) and **Elder Assessment Instrument (EAI):** to assess the mistreatment of subjects including four subtypes, i.e. abuse, neglect, exploitation and abandonment Standardized Semi-structured interview schedule(r=0.830.

Results: A quarter of elderly are at risk of being mistreated and 15.6% of older persons reported at least one sub-type of mistreatment. Neglect is the most common type of mistreatment reported by older persons followed by exploitation. The older persons in age 80 years and above and living alone are more prone to mistreatment. Interventions focusing self-development of older persons, family, community, healthcare personnel, and police is essential to tackle this social problem. Risk reduction strategies for older persons, family and community, family education, early screening for mistreatment may reduce the risk of mistreatment of older persons. Early diagnosis, referral, treatment and counselling services to victim and family may have positive effect on functional and coping ability of older person and family.

Conclusion: Nurses and doctors are best suited for early identification of mistreatment of older persons. It is a challenge as the older persons often hesitate to disclose mistreatments to others including healthcare personnel.

- **A descriptive study on health problems and health seeking behaviour of elderly population dwelling in selected slums of city Ludhiana, Punjab.**

Sandeep Kaur, Daisy Dayal, Anurag Chaudhary

College of Nursing Ludhiana

Introduction: The proportion of world's population over 60 years will double from about 11% to 22% between the years of 2000 to 2050. The absolute number of people aged 60 years and above is expected to increase from 605 million to 2 billion over the same period. Age not only affects person's looks but also affects physical condition. Because of lack of health care facilities in slum area, there is a need to improve geriatric health care and support during illness. Elderly population is neglected by the modern society and are more prone to diseases due to poor food intake, poor physical activity and less resistance against infection. So, the researcher felt the need to conduct this study with an objective to find out association between health problems and health seeking behaviour of elderly population dwelling in slums.

Materials & Methods: Descriptive research design was used to assess various health problems and health seeking behaviour in elderly population. The study was conducted among200 elderly persons dwelling in urban slums using convenience sampling technique and structured interview schedule to collect the data.

Results: Majority of the subjects, i.e, 91 (45.5%) were having health problems related to eye and ear. In health seeking behaviour, 109 (54.5%) sought allopathic treatment to combat health problems.

Conclusion: Majority of the subjects had various health problems like cardio-vascular, respiratory, digestive, central nervous system, endocrine, genito-urinary, eye/ear, musculo-skeletal, skin, oncological problem and maximum number of subjects seek allopathic treatment.

- **Information Communication and Technologies (ICTs) for India's Elderly: Issues and Challenges**

Balamurugan J

Assistant Professor, Department of Social Sciences, School of Social Sciences and Languages, VIT University, Vellore- 6320154, Tamil Nadu

The elderly in India were traditionally regarded to be revered members of their families and this tradition was followed since ancient times. But with rapid social change particularly the predominance of the nuclear family the elderly are fast losing their pre-eminent social status. The transformation of society based on a fast industrial and global cultural system has led to an erosion of traditional values and the elderly have to accept the transformation of the family life and meet the challenges of ensuring a graceful and healthy ageing. The use of ICTs for the elderly must focus on preparing for change, care services, health care, and a range of smart home technologies.

- **Impact of JPMR and deep breathing exercises on anxiety, psychological distress and quality of sleep among hospitalized older adults**

Neeru Kalra,[1] Deepika C Khakha,[1] Sujata Satapathy,[2] A B Dey[2]

College of Nursing, DMCH ludhiana[1], All India Institute of Medical Sciences[1]

Introduction: Old age is a crucial period of life during which mental health related problems may become a cause or an effect of various physical health related problems, amongst

which anxiety, psychological distress and sleep difficulties are commonly reported. Among the non-pharmacological interventions, deep breathing and other relaxation exercises have been found to be effective for various categories of hospitalized population**.**

Materials and Methods: This Quasi experimental study included 81 subjects admitted in Geriatric ward, AIIMS, New Delhi during the period of June to November 2013. Subjects in the experimental group (n=48) received intervention of JPMR and deep breathing exercises for 7 consecutive days with the help of audio CD. Control group (n=33) received standard routine care for 7 consecutive days. Standardized tools used for the study were Geriatric anxiety inventory (GAI), Kessler-10(K-10), Pittsburgh sleep quality index (PSQI). At the end, intention to treat analysis was done and non- parametric tests were applied.

Results: A total of 30 subjects from each group completed the study and the groups were comparable. Majority of the subjects were male, married, belong to joint family and Hindu religion with monthly income less than 10,000 in both the groups. There were significant improvements in the anxiety scores ($p<0.001$), psychological distress

scores ($p<0.001$) and quality of sleep scores ($p<0.001$) in experimental group. Also, the patient's perception about current sense of wellbeing improved in the group receiving JPMR and deep breathing exercises. A significant positive correlation was found between anxiety, psychological distress and quality of sleep.

Conclusion: JPMR and deep breathing exercises are effective in reducing anxiety, psychological distress and quality of sleep in older adults.

- **Abuse and Social Neglect among Elderly patients in Punjab.**

Nidhi Sagar

Professor College DMCH.

Introduction- There is increased risk of physical, verbal, sexual abuse and social neglect among elderly patients. Despite of all advances, they are forced to live life of incarceration.

Material and Methods – A descriptive (comparative) research design was used to conduct the present study using purposive sampling technique among selected 45 elderly male and 45 elderly female patients admitted in selected hospital of Punjab, India and the abuse and social neglect was assessed by using self structured tool. Analysis of the data was done by using descriptive and inferential statistics.

Results- It was found that more number of male patients experienced verbal (75.6% vs. 64.4%) and physical abuse (53.3% vs. 46.7%) as compared to female patients. In sexual abuse only 4.4% female patient's experienced unwanted touch, while male patients did not reported sexual abuse. Social discrimination was reported by maximum number of patients, which was more among female patients (77.8%) as compared to male patients (51.1%). Poor shelter and food were next common aspects of social neglect among patients, while more number of female patients (20% vs. 8.9%) reported poor clothing whereas more number of males reported (24.8% vs. 17.8%) poor personal hygiene.

Conclusion - This study reveals that verbal and physical abuse is more in elderly male patients and social neglect is more in elderly female patients.

- **Dental care for high need, high cost patients – an urgent priority**

Seema Sachdeva

College of Nursing, AIIMS, New Delhi

Introduction: The proportion of older people continues to grow worldwide. By 2050, it will be 2 billion, 80% living in developing countries. Globally, poor oral health amongst older people has been particularly evident in high levels of tooth loss, dental caries, periodontal disease, xerostomia and oral precancer/cancer.

The Dental Problems of the elderly can be divided into four groups. Problems arise with their teeth, gums, dentures and their medical histories.

Common dental problems in older people are:

Tooth Decay: Older people are more vulnerable to tooth decay. Causes: poor oral hygiene, decrease check ups, age-related salivary changes; a poor diet. Management includes restoration and extraction. Tooth decay is largely preventable by reducing the quantity and frequency that sugar is consumed. Tooth Ache

Edentulous/ tooth loss: Causes: Dental caries, use of tobacco and periodontal diseases are major causes of tooth loss.

Functional impairments can be chewing, nutrition, communication and social interactions problems, speech, lower intake of numerous nutrients like decrease intake of protein, calories, Vitamins, fibre thus lower serum albumin and lower BMI.

Periodontal Disease : Gum (periodontal) disease is an infection of the gums and surrounding tissues. The two forms of gum disease are: Gingivitis, a mild form and Periodontitis, a more severe form that can damage the soft tissues and bone that support teeth. that is reversible with good oral hygiene. In gingivitis, the gums become red, swollen and can bleed easily.

Xerostomia: It is too little saliva to keep your mouth wet/clean. Causes are: Drug-induced xerostomia, diseases like HIV/AIDS, radiation therapy, and chemotherapy and nerve damage. The common symptoms associated with dry mouth include a constant sore throat, burning sensation, problems speaking, difficulty swallowing, hoarseness or dry nasal passages.

Oral pre cancer and oral cancer: Age-specific rates for cancer of the oral cavity increase progressively with age. Major causes are tobacco use, regular smoking and alcohol. Warning signs of oral cancers: A sore, irritation, lump or thick patch in the mouth, white or red patch in the mouth, difficulty moving the jaw or tongue, numbness in the tongue or other areas of the mouth

Denture-related conditions: Denture stomatitis correlates to denture hygiene or denture plaque. Other major denture-related lesions include

denture hyperplasia and traumatic ulcer, fungal infections.

Management of oral health problems includes regular fluorides mouthwashes, rinsing with a chlorhexidine, flossing, and regular dental checkups and denture care.

Conclusion Prevention is the easiest cure. Regular dental check -ups, liberal use of fluoride toothpastes and effective oral hygiene twice a day should be encouraged.

- **Understanding the association of chronic morbidities and access to money among elderly in selected states of states of India**

Mukesh Ravi Raushan

International Institute for Population Sciences, Mumbai

This paper tests the hypothesis that financial accessibility reduces chronic morbidities among elderly in India. Data from recently conducted BKPAI survey among 9852 individuals in the state of Himachal Pradesh, Punjab, West Bengal, Orissa, Maharashtra, Kerala, and Tamil Nadu is used in the analyses. The financial accessibility is measured using access to income while chronic morbidity includes any of the five morbidities arthritis, angina, diabetes, asthma, and hypertension. Result suggests that financial accessibility reduces the risk of ill health among elder.Controlling for socio-economic and demographic correlates, the predicted probability of any chronic morbidity was 51% among those with financially independent compared to 54% among those without financial access. Old with access to money were less at risk of such morbidities. Among those with financial access the predicted probability for diabetes was 17% compared to 12% among without financial access. The pattern was similar for arthritis, for this was 21%. Based on the results, we conclude that the risk of chronic morbidities increases with increase in age ($p<0.001$).

- **Role of Physiotherapy in Older Adults**

Ruchika Madan, A B Dey

Department of Geriatric Medicine, AIIMS

As age increases there occur some unavoidable changes in the physiological, neuromuscular, musculoskeletal systems of the body. These changes make persons prone to various ailments including reduced muscular strength & endurance, decreased muscle flexibility; joints hypomobility; reduced coordination; impaired joint functioning; reduced physical stamina; dementia etc. Some other common impairments among elders include Parkinson disease, stroke, arthritis, osteoporosis, frequent falls, fractures, terminal illness .These ailments along with polypharmacy and co-morbidities lead to decreased functionality and quality of life.

The management of such geriatric patients involves multi-disciplinary approach including physiotherapists as important team members. Physiotherapists play extremely important role in geriatric care for OPD as well as in-patient departments patients. Before beginning the therapeutic interventions the physiotherapist makes thorough assessment of patient for the sensory/motor systems,cranial nerve and coordination testing, strength assessment, joint mobility and stability; functional evaluation; balance abilities.

Once the evaluation is complete and the therapeutic goals are identified, the physiotherapist starts interventions which include wide variety of techniques such as manual joint mobilization, muscle stretching, joint mobility exercises, coordination & balance training, safe fall strategies, postural correction, aerobic conditioning, relaxation training, bed mobility training, ventilator muscle training. Therapeutic techniques are also helpful to reduce the myofascial pains associated with postural faults and trigger points. Mobility training is important for maintaining the bone density and quality of life.

- **Depression: A problem for many older adults and the elderly**

Md. Salauddin Khan

Associate Professor of Economics, Dr.B.N. Dutta Smriti Mahavidyalaya, Burdwan, WB

Depression is a common problem in older adults and its symptoms affect every aspect of life, including energy, appetite, sleep, and interest in work, hobbies, and relationships. Unfortunately, all too many depressed seniors fail to recognize the symptoms of depression, or don't take the steps to get the help they need.

- Recognizing depression in the elderly starts with knowing the signs and symptoms. Depression red flags include:
- Sadness or feelings of despair
- Unexplained or aggravated aches and pains
- Loss of interest in socializing or hobbies

- Weight loss or loss of appetite
- Feelings of hopelessness or helplessness
- Lack of motivation and energy
- Sleep disturbances (difficulty falling asleep or staying asleep, oversleeping, or daytime sleepiness)
- Loss of self-worth (worries about being a burden, feelings of worthlessness or self-loathing)
- Slowed movement and speech
- Increased use of alcohol or other drugs
- Fixation on death; thoughts of suicide
- Memory problems, slowed movement and speech
- Neglecting personal care (skipping meals, forgetting meds, neglecting personal hygiene)

While depression and sadness might seem to go hand and hand, many depressed seniors claim not to feel sad at all. They may complain, instead, of low motivation, a lack of energy, or physical problems. In fact, physical complaints, such as arthritis pain or worsening headaches, are often the predominant symptom of depression in the elderly.

It is important to be aware that medical problems can cause depression in older adults and the elderly, either directly or as a psychological reaction to the illness. Any chronic medical condition, particularly if it is painful, disabling, or life-threatening, can lead to depression or make depression symptoms worse.

In old age, isolation and disconnection only make depression worse. The more engaged he/she is—socially, mentally, and physically—the better he will feel. There is animportance of face-to-face connection.And remember, it's never too late to build new friendships. Start by joining a senior center, a book club, or another group of people with similar interests.Healthy habits matter to reduce depression. The better care one takes of his/her body, the better he/she will feel.Therapy works well on depression because it addresses the underlying causes of the depression, rather than just the symptoms.

Other tips for helping a depressed elderly friend or relative: i) Invite your loved one out ii) Schedule regular social activities iii) Plan and prepare healthy meals iv) Encourage the person to follow through with treatment v) Make sure all medications are taken as instructed vi) Watch for suicide warning signs.

- **Epidemiology on Geriatric (Elderly) Emergencies reported in 108 ambulance services among GVK EMRI operational states in India in 2015**

Dr. G.V. Ramana Rao, Ms. Aruna Gimkala

GVK Emergency Management and Research Institute, Secunderabad

Introduction: Infections, end organ complications of many chronic diseases, poverty and isolation are known evils of elderly in India where in 11% are elderly population but mostly live in rural areas with limited access to higher levels of medical care. Hence, a study of epidemiological aspects of elderly utilizing 108 services is eye opening for policy and service planning perspectives.

Material and Methods: A Retrospective observational study. Distress callers for aged 60 and above years complained of all types of emergencies and decided to avail the GVK Emergency Management and Research Institute (EMRI) toll free number 108 Emergency Ambulance Services in the year 2015 were included in this study. Analysis of records was done using Micro Soft Excel. Source: Computer Telephonic Integrated obtained from Emergency Response Center of GVK EMRI 14 operating States and 2 Union Territories.

Results: A total of 604196 availed 108 services. Major Findings: State Tamil Nadu 18.34%, December 10%.Age 58.4% was in 60-69. Males 59%, Females 41%. Incident Area Rural 68.25%. Socio-economic status-Backward caste 42.2%, 27.31% White card. Emergency Type-Acute abdomen 21.20%, Respiratory 16.04%, Cardiovascular 15.07%, Trauma Vehicular 10.74%. Transported and admitted to hospital 98%, Treated on scene 1% and Expired on scene 1%.

Conclusions: Every tenth beneficiary of 108 services was an elderly in the year 2015 at 108 GVKEMRI. Gastro-intestinal manifestations were the leading cause for seeking EMS services. Rural elderly were significantly benefited. Detailed research linking ambulance based pre hospital care and post hospitalization outcomes and impact are needed to develop relevant insights into geriatric emergency care in India.

- **Quality of Life among the Ageing Population**

Shantha Maria, Ms. Lakshmi Jithendran

Mount Carmel College, Bangalore

Introduction : The rapid ageing population has brought to the fore front the well being of older population and emphasised the need to identify individuals at greater risk of adverse health outcomes. The Indian families have shrunk the carrier options of most of the young have left the elderly with limited options.

The present study aimed to study the Quality of life of the elderly living in family to those in old age homes a community living environment. A sample of 100 elderly, equal number of those living in families and those living in old age home constituted the sample.

The Older people's Quality of Life (OPQOL) was assessed by a questionnaire. This consisted of 35 statements on life over all, health, social relationship and participation, independence control over life and freedom, home and neighbourhood, psychological and emotional well-being, financial circumstances, leisure activities and religion were considered.

The results show that community living is able to substitute family. The quality of life is more an elderly individual's attribute.

- **Research in Psychosocial Gerontology – Past, Present and Future**

Jamuna Duvvuru & Ramamurti, P.V.

Centre for Research on Ageing, Department of Psychology, S.V. University, Tirupati

Research on aging in India today is focused on the medical, biological, behavioural and social sciences. This presentation focuses on developments in research, education and training in psychological gerontology. Since the earliest studies in the late 1950s and early 1960s that concentrated on the behavioural and social sciences, the pace and breadth of research on aging in India increased during the 1980s and continues today. Approximately, more than 3,000 articles on various aspects of aging in India have appeared in a variety of Indian and International Journals dedicated to aging and in subject specific journals. A major surge of social and behavioural research has occurred since 1990 covering varied domains. In contrast to the developments of research, a trajectory of gerontonlogical education has been less robust. Despite initial developments, gerontology as a special course of study in higher education has grown slowly. During 2000s, Longitudinal Aging Study in India (LASI) and some Prospective studies have been initiated which are significant development in the building database on psychosocial gerontology. The lacunae in the studies in psychosocial gerontology would be highlighted in this presentation. Future research focus on uncovered areas are eg., eldercare models with viable public and private options, models of long term Vs short term senior care, concerns of income security for the elderly, efficacy of legal and policy provisions, mental health and aging, cognitive retraining, psychosocial markers of long life. In specific, the welfare of seniors rests on the utilization of sizable human resources of its elders to promote healthy and active aging.

- **Stress and Coping Among Adult Male and Female HIV/ AIDS Patients**

Jayanthi, T.

Apollo College of Nursing, Apollo Hospitals, Aragonda (A.P)

The disease is a period with many stresses and anxious expectations. Emotions associated with the diagnosis of HIV sero conversion are largely a reaction to a multiplicity of factors such as a radical alteration in one's sense of self, chronic somatic preoccupation, fear of illness, anger and frustration. A study was carried out on a sample of 720 HIV/AIDs patients (324 female and 346 male) attending Anti Retroviral Therapy Center (ART) at SVRR Government Hospital, Tirupati and Chittoor with an objective to identify the sources of stress, intensity of stress and coping strategies used by the patients. Results indicate that social supports especially family supports and respite interventions by Health care professionals are significant in reducing the stress among HIV/AIDs persons. Need for supportive psychological interventions towards comprehensive health care are highlighted.

- **Ageing, reminiscences and the life-course: A narrative understanding of the self**

Akshiptika Rattan

Department of Sociology, GGSCW, Chandigarh

Introduction The meanings, realities and ideologies of ageing are multiple and heterogeneous. To analyze the complex relationship between the self and the life-course, it is important to understand the subjective and experiential dimensions of ageing. The elderly persons do not just mechanically follow the cultural scripts of ageing but negotiate with them to reproduce, refine, resist and reformulate these interpretations and pathways.

Materials and Methods The paper focuses on four case-studies of men (2) and women (2) ranging in age from 71 to 85 years from North India selected using purposive sampling. Striving to focus on the lived realities of the everyday life of the elderly persons, qualitative methodology with the narrative method of inquiry is employed.

Results The experience of ageing defies any sort of linearity. The elderly persons are always in the state of being and becoming – the quint-essentially fluid state of the self. The narrative permits for the agentic constitution of the elderly self without deracinating it from the context of its life-course. Reminiscences take the form of a quest narrative that reclaims, reinterprets and reinvents the self. The act of narration for the elderly person emerges as a social performance.

Conclusions: The personal narratives unravel the discursive practices through which hegemonic representations of old age are const-ructed and reinforced. They help to problematize and decode the taken-for-granted assumptions and myths about ageing. The narrative understanding of the self in old age enhances the possibilities for a wholistic, critical and humanistic social gerontology.

- **Elderly health care: Need for strengthening services**

Chandana Sarmah

Guwahati

The phenomenon of demographic ageing is taking place at a rapid rate in India. In a vast and culturally diverse country like ours, the elderly and their needs are also not homogenous. The state of Assamis inhabited by a number of different ethnic communities. Among these communitiesexistence ofcertain positive factors like a strong familial and social structure, high social status of elderly and continued physical activity among themseems to promote healthy ageing. But under the rapidly changing socio-economic conditions and age specific migration, the scenario may soon be changing.

The present study is among 490 elderly in the age group of sixty years and above, belonging to two scheduled tribes ofKarbi and Tiwa community of Garmari area ofMarigaon district, Assam.The data for the study were collected through a structured scheduled.

Health care appears to be the most important need for the elderly. Given the social conditions of illiteracy, lack of awareness and poor economic condition, the family is unable to provide health care to the desired extent. 31.43% of the elderly are suffering from some self reported chronic diseases, of which 58.44% have been diagnosed by a doctor but medication has not been followed.Mostly the elderly depend on the medical advice provided by the local drug stores.

Under the circumstances, it becomes imperative to strengthen the public health care services among the rural tribal population. The present paper attempts to look into the existing health care services in the district and find some solutions to meet this urgent need.

- **Afflictions of Elderly Widowers: A Sociological study**

Jayashree, S

Department of Sociology, Karnatak University Dharwad.

Widowhood is one of the crises in life. There are ample of studies focused on widows and their woes. The problems of widowers have not been given any preference in research.It might be due of patriarchal system and dominance of men in all productive endeavors. However, the story of elderly widowers altogether different and it unfolds many pertinent subtle issues.

Material and Methods Present study concentrated on elderly widowers. The study was conducted in selected villages of Belgaum district. Karnataka. Data for the study was collected through interview schedule with lot of open ended questions. Some of the unique case studies also undertaken to understand the subtle issues pertaining to elderly widowers.

Clayton and her colleagues (1972) and Bornstein, Clayton (1973) studied depression in older widowers. They found that almost half of the older surviving spouses were depressed at some point during their bereavement year and nearly 15 percent were depressed for the entire year.Rubinstein characterized elderly widowers as either successfully or unsuccessfully reorganization their lives following the death of their wives. (Rubinstein, 1989).

Results and Conclusion In the present study majority of the respondents were illiterate. 31.85% of the respondents lived in Joint families. 56.63% married within their kin group. (Consan-guineous marriage 11.50% were living alone, 15.04 percent were remarried. 47.78% were married before they attained age of 21. Like widows, widowers were also not attending auspicious functions like marriages and religious

functions..Various degrees of unhappiness appeared among respondents and even after the passage of years theywere unable to reconstruct a full new life.

- **Impact of Biosocial Factors on Ageing**

Anuvita Bakshi and Rekha Naithani

Introduction: The age of 55-65 years is very important span in life. One has accepted the typical physiological changes that are taking place. In the vocational field the adult is at the top of his career or has just retired. The major task is planning has tobe done for the post retirement life, launching children and health problems. Leisure time activities that give opportunities for special contacts and provide satisfaction have tobe developed. One has to learn to live with it and take measures to control it. Deterioration of health, financial problems , children not having come upto the expectations, dissatisfaction from what life has offered, strained relationship, increased dependency, fall in social contacts may lead to stress, anxiety and depression resulting in an adverse effect on health.

Material and Methods: In order to study the oldage adjustment of aged persons in different biosocial aspects, SJOAI, NPC Agra, was used as base. Than three points scale was prepared.

Results: According to the findings, majority of respondents (65.5% male and 66.8% female) fell into average category of overall adjustments. Only 11.5% males and 17.3% female's belonged good category while 23% male and 16% female fell into poor category of adjustments. One fifth of respondents had no worries while nearest to half respondents had major worries about their children's future. 20% males as well as females reported they had major worries about financial conditions.

Conclusions: The many physiological, economical emotional and interpersonal fact of ageing influences the social functioning and well-being of individuals in different ways.

- **Cognitive impairment among the elderly of Kautala: A study in rural West Bengal**

Ketaki das*, Moumita Biswas Chakraborty, Barun Mukhopadhyay****

**West Bengal Voluntary Health Association, Kolkata (ketakiwbvha@gmail.com)*
***Indian Statistical Institute, Kolkata-108*

Introduction Ageing and age related problems are now a burning issue throughout the globe. People are surviving more added years due to technical and medical advancements. As people age the quality of life may not remainlike that in the younger age. Ageing comes with a lot of physical and mental changes. Increasing age leads to decreasing mental functions which mayaffectthe quality of life among the elderly. Present study aims to find out level of cognitive impairment (mild to severe) among the elderly of a rural settlement in southern West Bengal.

Material and Methods This study included 198 Bengali speaking individuals of both sexes, aged between 60 – 90 years, residing at Kautala of Raidighi block, a rural settlement of the district South 24 Parganas of West Bengal. To assess the mental functioning (normal functioning and its deviations) and its sociodemographic correlates, a pretested and validated form of Short Portable Mental Status questionnaire (SPMSQ) and a socio-demographic questionnaire were used.Written consent was obtained from the study participants after explaining them the study objectives. SPSS version 16 was used for performing statistical analysis.

Results Bivariate analysis shows that, there is significant association between sex and cognitive impairments. Cognitive impairments were found to be higher among the female participants than their male counterpart. Educational level has great impacts in this regard as well. The study revealed that, irrespective of sex, those who complete high school or acquire more education, had a good memory but the participants with low educational level reported to be more vulnerable.

Conclusions It can be concluded thatvariable cognitive impairment is a common ailment among most of the elderly. Socio-demographic variables like sex, marital status and educational level are the significant predictors of the level of cognitive impairments.

- **Sibling offences against elderly: murder during commission of robbery**

Dr. Mamta Patel

Professor, Criminology and Forensic Science, Dr. Harisingh Gour University, Sagar (M.P)

Introduction: Not all murder offenders intend to kill their victims. An incident begins as a robbery motivated by instrumental ends, such as getting money, but end in someone's death. The term sibling offence refers to the incident that

initiates the homicide. A sibling offence may be a crime such as a robbery or another incident.

Material and Methods: In this study total 61 cases of robbery have been found reported in print media during the year 2011 to 2015. Of these cases, 47.54% were sibling offences i.e. murder for robbery. The main objective of this study was to know about the patterns of sibling offences. The present research work has been analysed by using content analysis method.

Results: Findings show that strangulation and stabbing were the two most common methods by which the victims met death. An examination of fatality does not necessarily support the idea that the involvement of gun caused the fatality as other factors, such as the intent of the offender, must be considered. Offenders select their victims inside the door that are relatively isolated and they act on the opportunity.

Conclusions: As observed in earlier studies, older people live in greater fear of crime. Elderly people, however, are less likely to take crime preventive measures. Relative to their numbers in the elderly population, women are over represented as victims of robbery.

- **Older persons' perspective wellbeing**

Shashi Mawar

College of Nursing, All India Institute of Medical Sciences, New Delhi

Elderly define well being as feeling healthy, free from pain and able to lead a positive life. They describe the feelings of well being as: happiness, contentment, satisfaction, peace of mind, comfort, enjoyment and euphoria. They also tend to associate with feelings of self worth and achievement. The pursuit of wellness would move our society towards supporting not only longevity but also vitality. There are several unanswered questions related to wellness; such as; an outcome or process; an all or nothing phenomenon; same for all the individuals; role of the individual in determining wellness; role of geriatric nurses in promoting and measuring wellness; significance of changes in functional and health status. Some of the determinants of well being in old age are: fulfilling relationships and social contacts; indulgence in activities of interest, remaining busy; building self-esteem; and good health. There are several barriers to well being: problems arising from poor physical health- severe and chronic pain; mobility restrictions, causing impact on social life and activities, ill health of family members etc.; mental health problems such as depression, dementia, insomnia, personal dependence; isolation and loneliness; and limited finances. There is a general desire that older people can play a more active role in improving their own well being. This is possible with support and help from others. Some of the interventions can be: getting involved in groups and activities (volunteering, campaigning and shaping policies), better access for older people with physical and sensory impairments, treat older people with dignity and respect, build trust, give people time and value the whole person, practical help and support in people's own homes by reliable competent trustworthy people, support at critical times (bereavement, failing health) and information regarding financial help (investment, govt schemes etc).

Abstract

Biological Sciences

- **Combating Ageing: Exploration of Novel Proteins for Diagnosis and Therapeutic Intervention in Age associated diseases.**

Sharmistha Dey[1], Nitish Rai[1], Shashank Shekhar[1], Amrendra Pratap Singh[1], Avinash Charavorty, [2] Prasun Chaterjee [2] A. B. Dey[2]

Department of Biophysics[1] and Geriatric Medicine [2] All India Institute of Medical Sciences, New Delhi

Population Census 2011 reported nearly 104 million elderly persons aged 60 years and above in India and the numbers are expected to increase due to rising life expectancy. Aging is the biggest risk factor for many diseases like Alzheimer's disease (AD), Parkinson's disease (PD), Frailty, Osteoarthritis (OA) and Cancer. We focus on diverse age related pathophysiology to study the altered proteome in order to find a protein marker. Recently our studies have shed light on the potential role of proteins like sirtuins, tau, p-tau, sestrins, 5- LOX, cartilage oligomeric matrix protein (COMP) and p38α in age related pathophysiology. We have determined the diagnostic potential of sirtuins, tau, sestrins and 5-lox for early diagnosis of AD by estimating their serum level in patients through surface plasmon resonance. The serum level of sirtuins and sestrins are also found to be altered in Frailty and PD while the serum COMP level was found to be elevated in OA knee patients. Our study has also revealed the role of P38α in head and neck squamous cell carcinoma (HNSCC) and modulation in serum P38α level during pre and post radiotherapy in older age group. Further, for the developmentof therapeutics targeting specific proteins, we have designed and synthesised peptides using solid phase peptide synthesis which specifically modulates the target proteins. The peptide modulator of 5-LOX, P38α and sirtuin1 has been successfully developed.Our study will help establish these potential proteins as a plausible candidate for detection and open exciting avenues for therapeutic interventions.

- **ERβ interacting proteins (Coregulators) versus Brain Aging: a possible mechanism to target neurodegeneration**

[1*]Vijay Paramanik and [2]MK Thakur

[1]Cellular and Molecular Neurobiology & Drug Targeting Laboratory, Department of Zoology, Indira Gandhi National Tribal University, Amarkantak (MP)-484887
[2]Biochemistry and Molecular Biology Laboratory, Department of Zoology, Banaras Hindu University, Varanasi-221005

Estrogen mediates its plethora of functions in the brain after recruiting host of interacting proteins by ERα (estrogen receptor) and ERβ. Like other members of the nuclear receptor superfamily, both the receptors have three functional domains–*N terminal transactivation domain (TAD)* containing activation function (AF)-1, *DNA binding domain (DBD)* and*C terminal ligand binding domain (LBD)* containing AF-2. Further, estrogen responsive gene regulation is dependent not only on transcription factor activation but also on chromatin remodeling by a host of coregulators- *coactivators* and *corepressors*. Although many proteins interacting with ERα have been reported, very little is known about the ERβ and its domain's interacting proteins in the brain during aging, when the level of estrogen and its receptor declines.To study the ERβ interacting proteins, we used recombinant ERβ and its TAD and LBD for pull down assay followed by western blotting and immunoprecipitation. For interaction study his-tag mouse ERβ and its domains were used to pull down proteins from nuclear extract of adult male mouse brain, whereas for expression studies nuclear proteins brain of young (6±1 weeks), adult (25±2weeks) and old (70±5 weeks) mice of both sexes were used.ERβ and its domains interacted with AIB, ERAP 140, Src, TrkA, CREB and pCREB. All these proteins showed age and sex dependent variation in expression as well as their interaction with ERβ and its domain.Such age and sex dependent studies of coregulators may be useful to understand the estrogen-mediated brain function during aging and target them.

- **Role of intermittent fasting and phyto-chemicals as hormetins for healthy aging**

Gurcharan Kaur, Rumani Singh, Shaffi Manchanda and Taranjit Kaur

Department of Biotechnology, Guru Nanak Dev University, Amritsar, Punjab, India

Introduction: Both dietary or caloric restriction and phytochemicals are being considered as key factors that can promote neuronal adaptability to the aging process as hormetins. Scientific validation of these cost effective interventions is important as sedentary lifestyle and psychological stress in growing age often disrupts the energy gain and expenditure balance leading to obesity and co-morbidities.

Methods: Mid and old age rats were put on late onset short term Intermittent Fasting- Dietary Restriction (IF-DR) regimen for 12 weeks to study its cognition and motor coordination enhancing potential andassociated changes in protein and DNA damage and mitochondrial ROS generation. The effect of feeding leaf powder of Ashwagandha in preventing the cognitive decline associated with diet induced obesity in rats was also studied.

Results: IF-DR was observed to resist cognitive decline and neurodegeneration, and hence may be a potential intervention to partially reverse age related brain functions impairments. Ashwagandha fed rats showed significant improvement in their working memory and locomotor functions during behavioral studies compared to HFD rats and also restored the levels of BDNF and its receptor TRKB and the expression of other synaptic regulators.

Conclusion: The simultaneous focus on "biological" and "behavioral" mechanisms may help to understand the underlying mechanism(s) of the potential beneficial effects of phytochemicals and IF-DR regimens. In the light of currentfocus on cost effective healthcare, intermittent fasting regimen has no direct financial burden and rather is nominalsavings on food expenses. Future research should focus on human cohorts to determine as to whatextent phytochemicals and fasting regimens are optimal for healthspan improvement.

- **Memory decline during aging- Recovery by epigenetic approach**

MK Thakur and Padmanabh Singh

Biochemistry and Molecular Biology Lab, Brain Research Centre, Department of Zoology, Institute of Science, Banaras Hindu University, Varanasi-221005, India

Introduction: Aging is usually associated with decline in memory. However, the molecular mechanism ofsuch decline is poorly understood. As epigenetic modifications of chromatin play an important role in the regulation of memory associated genes, we have investigated whether epigenetic approach can be used to regulate the memory decline during aging.

Material & Methods: Young, adult and old male mice of Swiss albino strain were used for the study. Recognition memory was analyzed by novel object recognition test. Expression of chromatin modifying enzymes and neuronal immediate early genes (IEGs)were analyzed at mRNA by qRT PCR and protein by immunoblotting, and epigenetic modifications by chromatin immunoprecipitation. Sodium butyrate and HDAC2 antisense oligo were used to recover the memory, expression and epigenetic regulation of neuronal IEGs in old mice.

Results: Age-dependent decline of recognition memory was associated with upregulation of HDAC2 and downregulation of neuronal IEGs in the hippocampus of old mice. Further, binding of HDAC2 was high; H3K9 and H3K14 acetylation level was low at the promoter region of these neuronal IEGs in old mice.Sodium butyrate orHDAC2 antisense oligo treatment recovered recognition memory, histone acetylation at the promoter region and expression of neuronal IEGs in old mice.

Conclusions: Taken together, these findings showed that higher HDAC2 reduced histone acetylationat the promoter of neuronal IEGs, down regulated their expression and memory during aging. These changes were recovered by epigenetic modulators in old, suggesting HDAC inhibition asa possible approach to recover memory decline during aging.

- **Differential expression of long noncoding RNAs during aging**

Sukhleen Kour and Pramod C. Rath

Molecular Biology Laboratory, School of Life Sciences, Jawaharlal Nehru University, New Delhi-110067, India

Long noncoding RNAs (lncRNAs) have emerged as regulators of genome-functions and protein-networks in eukaryotic organisms. In an attempt to probe into molecular aging process at cellular and tissue-levels, we have analyzed expression of two novel long noncoding RNAs,namely long intergenic noncoding RNA brain expressed (LINC-RBE)& LINC-repeat sense antisense (LINC-RSAS) isolated in our laboratory, in brain and

testes of rats of immature/young (4 weeks), adult (16 weeks) and old (70 weeks) ages.

By reverse transcription-polymerase chain reaction (RT-PCR), we show that expression of both lncRNAs in both tissues increased from young to adult and decreased from adult to old ages. By RNA fluorescence in situ hybridization (RNA-FISH), we show that both lncRNAs were differentially expressed in cell type-specific manner in cortex, hippocampus, cerebellum of brain and testes in an age-dependent manner declining in the old age. The lncRNAs were cytoplasmic-expressed in cultured neurons from hippocampus of the adult brain but nuclear-expressed in primary/secondary spermatocytes of the testes. Treatment with retinoic acid (RA), a differentiation-inducing agent, increased expression of LINC-RBE at transcriptional level but LINC-RSAS at post-transcriptional level in the neurons. The nuclear expression of the lincRNAs showed chromatin-bound foci decreasing in old age. They may represent nuclear and cytoplasmic RNA processing molecular factories.

Thus LINC-RBE and LINC-RSAS represent involvement of lncRNAs in aging in mammals. It would be interesting to further investigate whether decreasedexpression of these lncRNAsreflectsa cause or an effect of the process of molecular aging at sub-cellular level.

- **Interaction of Pax6 with Iba1 indicates Pax6 mediated and microglia dependent immunological surveillance of brain in aging mice**

Shashank Kumar Maurya and Rajnikant Mishra

Biochemistry and Molecular Biology Lab, Department of Zoology, Institute of Science, Banaras Hindu University, Varanasi- 221005, India

Introduction: The Pax6 is essential for development of central nervous system (CNS), eyes and pancreatic alpha-cells. The expression of Pax6 gets reduced in brain of mice during aging. Patients having mutations in Pax6 show phenotype like age-associated neurological disorders. Since age-associated immunological defects are also observed, it has been intended to study expression and interactions of Pax6in brain of aging mice.

Materials and Methods: The expression pattern of *Pax6*was evaluated by RT-PCR, qPCR and western blot. The co-localization of Pax6 and Iba1 was analysed by immunohistochemistry. Interaction with genetic elements was evaluated by ChIPin brain of aging mice.

Results: Modulation in expression of *Pax6*, microglia specific (*Tmem119,Iba1*), inflammatory (*Ifn-γ, Tnf-α*), anti-inflammatory (*Tgf-β, Arg1*), neurofilaments (*Nefm, Nefl*), andastrocyte (*S100β, Gfap*) was observed in brain of aging mice. Co-localization of Pax6 and Iba1 was observed in olfactory lobe, cerebellum, parahippocampal gyri of hippocampus, in corpus callosum of cereberal cortex in brain of mice.ChIPwith anti-Pax6 shows binding sites of *S100β, Gfap, Iba1*, *Bdnf, Sparc*, *Tmem119*,*Pcna*, and *Cat*.

Conclusions: The Pax6 either directly or indirectly binds to promoter sequences of genes essential for immunological surveillance and energy metabolism in brain. The alteration in levels of S100ß and genes of oxidative stress management indicates involvement of Pax6-TGF-ß-Catalase axis in aging. The expression and co-localization of Pax6 with Iba1 indicates Pax6 mediated and microglia dependent immunological surveillance of brain in aging mice.

- **Oxidative stress and oxidative stress responses in aging human retina**

Tapas C Nag, Shashi Wadhwa

Department of Anatomy, All India Institute of Medical Sciences, New Delhi 110029 India

Introduction: Vertebrate retina is prone to damage by oxidative stress (OS), owing to its constant exposure to light, high rate of oxygen consumption and high membrane lipid content. However, specific retinal regions and cell types that suffer from OS remain unknown.

Material and Methods: We examined immunoreactivity (IR) to OS biomarkers (4-hydroxy 2-nonenal [HNE] and nitrotyrosine, and enzymes involved in OS response (glutathione peroxidase-1, glutathione S-transferase-π1 and glutarexoxin-1) in donor human retinas at different ages (35-91 years; N=24), by immuno-histochemistry.

Results: Between third and six decade, HNE-IR was present in inner nuclear layer and later (>62-years), it expressed in macular cone outer segments (COS). With progressive aging, IR appeared strong and widespread in many parafoveal COS, indicating excess HNE formation. In all maculae, IR was seen in parafoveal COS, whereas it was present in 10/24 of perifoveal and in 6/24 of peripheral COS.IR to nitrotyrosine was present in photoreceptor inner segments and appeared significantly in the macula with aging. Of the antioxidant enzymes studied, glutathione peroxidase-1 and glutathione S-transferase-π1 was

present moderately in outer and inner plexiform layer and photoreceptor inner segments, but it was only glutaredoxin-1 that expressed in parafoveal COS with advanced aging, indicating its predominant protective role.

Conclusions: These data indicate that the parafoveal COS and inner nuclear layer are the major sites of lipid peroxidation and that glutaredoxin-1 is perhaps involved in protecting cones against lipid peroxidation with advanced aging.

- **Effect of antioxidants on Age induced alterations in Biological Clock**

Anita Jagota

Neurobiology and Molecular Chronobiology Laboratory, Department of Animal Biology, School of Life Sciences, University of Hyderabad, Hyderabad-500 046, India.

The age-related neurodegenerative disorders in the elderly have increased dramatically parallel to increase in longevity limiting quality of life. Aging is associated with changes in several basic parameters of circadian timing system (CTS) in mammals leading to circadian dysfunction. The suprachiasmatic nucleus (SCN) in hypothalamus contains a light-entrained circadian clock. It is involved in regulation of neuronal, endocrine and behavioral rhythms through the expression of various clock genes. It regulates the rhythmic production and release of serotonin derivative, melatonin (messenger of darkness) from pineal gland via multisynaptic efferent pathways. This involves close interaction of core circadian machinery with a network of interconnected transcriptional and translational feedback loops.

To understand the age induced stoichiometric alterations in interactomes of daily chronomics in neurodegenerative changes in the functional integrity of CTS, daily rhythms in various parameters in SCN at variable time points (Zeitgeber time (ZT) - 0, 6, 12 and 18) in three age groups (3 (adult), 12 and 24 months) of male Wistar rats maintained in light–dark conditions (LD 12:12). We report here, the age-induced change in interactions between various 5-HT metabolism components by middle age (12 m) changing further by 24 m. The m-RNA expression for clock genes such as *bmal1, per1, per2, cry1, and cry2* was rhythmic in SCN of adult rats. However in 12 and 24 m, the phases of expression of these genes were significantly altered with abolition of daily rhythms of *rCry1, rCry2* and *rBmal1* in 24m. Differential alterations with aging in the levels and chronomics of 2-D protein profiles and locomotor rhythms were observed. As melatonin, a multitasking molecule, an endogenous synchronizer of rhythm, an antioxidant and an antiaging drug, declines with aging, the effects of melatonin administration on age induced desynchronization in these parameters were studied. This work may prove useful towards targeting novel treatments for circadian dysfunction, good health and longevity.

- **Mechanism of Aging associated Thrombosis**

Sanjana Dayal

University of Iowa, USA.

The incidence of thrombotic events such as stroke, myocardial infarction, deep vein thrombosis and pulmonary embolism increases with age. However, the mechanisms by which aging contributes to these phenotypes are not known. We have investigated theprothrombotic role of oxidative stress during aging specifically its effect on regulation of platelet activation. In a recent study, we tested the hypothesis that aged mice over expressing the antioxidant enzyme glutathione peroxidase-1 (Gpx1) are protected from experimental thrombosis. The findings demonstrated that the time to stable occlusion after photochemical injury of the carotid artery, was significantly faster in aged mice compared withyounger mice. Unlike wild-type mice, aged transgenic mice over expressing Gpx1 (Gpx1 Tg) did not exhibit faster times to occlusion of the carotid artery. Aged wild-type mice also exhibited increased susceptibility to venous thrombosispost inferior vena cava ligation and Gpx1 Tg mice were protected from this aging-related enhanced susceptibility to venous thrombosis. Age-dependent platelet hyperactivation, evidenced by increased intra-platelets hydrogen peroxide, fibrinogen binding, and activation offibrinogen receptor αIIbβ3, were observed in thrombin-activated platelets from wild-type but not Gpx1 Tg mice.Enhanced platelet activation responses in aged mice were also prevented by PEG-catalase or apocynin, an inhibitor of NADPH oxidase. Aged mice displayed increased intra-platelet expression of $p47^{phox}$ and superoxide dismutase-1, suggesting a mechanistic pathway for increased H_2O_2 generation. Further, the accumulation of platelet on collagen surface was found increased with platelets from aged wild type mice but not Gpx1 Tg mice. Consistent with the findings in mice, platelets from older human subjects also exhibited an increase in activation of αIIbβ3 and increased accumulation of platelets on

collagen surface compared to platelets from younger individuals. In summary, aged mice develop increased susceptibility to both arterial and venous thrombosis, and that H_2O_2-mediated platelet hyperactivation is a likely mechanism leading to this prothrombotic phenotype. A similar mechanism may also lead to activation of platelets in aged humans. These findings suggest that therapeutic strategies targeted toward lowering platelet H_2O_2 levels may have the potential to decrease thrombotic complications of aging. One potential strategy would be to target NADPH oxidase,since several small molecule and peptide-based inhibitors of Nox2-containing NADPH oxidases subunits are currently in development.

- **Stress induced sterile inflammation in development of cardiovascular disease: New insight**

Gausal A. Khan, Indranil Biswas, Bandana Singh and Saumya Bhagat

Department of Hematology, Defence Institute of Physiology and Allied Sciences, Lucknow Road, Timarpur, Delhi, India

Sterile inflammation (SI) is the pathophysiological basis of several cardiovascular diseases (CVDs) like atherosclerosis, thrombosis, myocardial infarction (MI), insulin resistance (IR) and it occurs in many acute conditions. SI is defined as non pathogen induced inflammation where stress or environmental factors as well as old age played a major role. But, the triggers of SI are still being identified, and the pathways that transduce SI signals are not completely clear. However, from last five years, we have been focused on identifying new cellular and molecular factors causing these diseases.

Stress induced release of damage associated molecular patters (DAMP) molecules including extracellular RNA and DNA (eRNA, eDNA), HMGB1 etc., from dying cells, causes toll like receptors (TLRs) activation leading to inflammation and CVDs. Therefore, we hypothesized that stress induced endothelial activation and inflammation may induce CVDs. Here, we use hypoxia as stress model. The present study was designed to analyze the effect of hypoxia exposure on inflammation - endothelium activation and to evaluate the involvement of innate immune receptors i.e. TLRs in coagulation activation, leukocyte adhesion (LA) and IR in vivo as well as in vitro model.

Hypoxia exposure induced expression of selectins, cell adhesion molecules (CAMs), von Willebrand factor, TNF-α, IFNs, ILs in lung and plasma. We further showed that hypoxia also induced tissue factor (TF) expression, microparticle pro-coagulant activity in plasma. However, hypoxia exposure decreased expression of anti-coagulant molecules i.e. thrombomodulin and TF pathway inhibitor in lung as well as in plasma. These results delineate that hypoxia exposure causes endothelial activation, inflammation and hypercoagulation.

Hypoxemia in the circulation can lead to venous thrombosis (VT) through TF activation. But mechanism of TF activation in hypoxia remains obscure. Ligands released from damaged tissues or cells are recognized by pattern recognition receptors (PRR) including TLR3. The expression of TLR3 and TF was analyzed by immunoblotting and RT-PCR in PBMC. The TF activity was evaluated in PBMC by two-stage chromogenic assay and fibrin deposition in lung was detected by immuno-histochemistry. The expression of TLR3, TF and TF activity was increased following AH exposure. The contribution of TLR3 was investiga-ted by poly I:C and TLR3 neutralizing antibody. We also found increased $ERK_{1/2}$ and c-jun phosphorylation following AH exposure in lung and PBMC. We further showed that the pre-treatment of TLR3 neutralizing antibody or ERK inhibitor (PD98059) 2h prior to AH completely abrogated $ERK_{1/2}$, c-jun phosphorylation and TF activation. The pre-treatment of TLR3 neutralizing antibody also inhibited ERK, c-jun, TF expression and fibrin deposition in lung vasculature.

LA is a hallmark of inflammation and associated with thrombosis. However, the molecular mechanism of hypoxia induced LA is still unknown. The expression of TLR3, IFNs and CAMs were analyzed by immunoblotting, ELISA, IHC and FACS in lung, PBMC and plasma. In an in vitro model, LA assay was performed. Hypoxia exposure significantly increased the expression of TLR3, IFNs and CAMs in lung, PBMC and plasma. Pre-treatment of anti-TLR3 antibody or chloroquine decreased hypoxia induced IFNs, CAMs expression and LA. Recombinant IFNγ treatment significantly augmented CAMs expression and anti-IFNγ antibody significantly decreased hypoxia induced CAMs expression in PBMC. We also found increased STAT1 phosphorylation in PBMCs both in hypoxia and poly I:C treatment, but pre-treatment of anti-TLR3 antibody or STAT1 inhibitor 4h prior to hypoxia or poly I:C treatment completely abrogated STAT1 phosphorylation and LA. Collectively, these data show that hypoxia induced adhesion is mediated through TLR3-IFNγ-STAT1 axis.

This study delineated the underlying signaling mechanism of hypoxia induced sterile

inflammation and CVDs which will lead to development of a therapeutic approach for the intervention of hypoxia induced Thrombosis/CVDs.

- **The Stress Hormone Hydrocortisone Affects Telomerase-Immortalised Human Bone Marrow Stem Cells Hormetically**

Indra Kumar Gopi[1], Lakshman Sodagam[2], Suresh I.S. Rattan[2]

[1]School of Chemical and Biotechnology, SASTRA University, Thanjavur, India
[2]Laboratory of Cellular Ageing, Department of Molecular Biology and Genetics, Aarhus University, Aarhus, Denmark

Introduction Hormesis is a biphasic dose-response to a stress, characterized by low dose beneficial effects and high dose toxic effects. Hydrocortisone (HC), a glucocorticoid stress hormone is controlled by HPA axis via negative feedback. Although high levels of stress hormones are associated with well-known negative health outcomes, it is not clear whether low levels of HC have any health-promoting effects. In this context, our experiments were designed to determine the potential beneficial hormetic dose of HC on human bone marrow stem cells *in vitro.*

Materials and methods Telomerase-immortalized human mesenchymal stem cells (hMSC-TERT) were generated by stable retroviral transfection of human bone marrow stem cells with catalytic subunit of telomerase with reverse transcriptase activity. Biological effects of a wide range of HC concentrations (from 50nM to 150μM) given to hMSC-TERT cells were determined by mitochondrial activity survival assays, lysosomal activity, LDH cytotoxicity, cell proliferation and cellular morphology. Differentiation abilities of hMSC-TERT was determined by osteoblastic alkaline phosphatase activity, by mineralised matrix formation, and adipogenic differentiation assays. Functional activities were determined by wound healing migration assay and by ß-gal associated scenescence-induction staining.

Results and conclusion A biphasic hormetic dose response was observed for hMSC-TERT cells exposed to a 187-fold range of HC (100nMto 150μM) for up to 3 days. Whereas HC concentrations above 5μM were clearly cytostatic, lower concentrations of HC had some stimulatory effects. For example, cells exposed to 1μM HC had enhanced survival, somewhat increased cell growth and improved cellular morphology. Low levels of HC (1μM) also increased the osteoblastic and adipogenic differentiation ability of hMSC-TERT cells. In a wound healing assay in vitro, HC also showed a biphasic dose hormetic dose response in the stimulation of cell migration. Further long term studies will elucidate whether chronic or intermittent exposure of human cells to stress hormones has hormetic beneficial effects.

- **Neural implications of early life challenges at adult-hood and senility**

Ishan Patro and Nisha Patro

School of Studies in Neuroscience, Jiwaji University, Gwalior 474 011

Early life challenges lead to neuroinflammation and thus influence neuronal function and survival with aging. Microglia and astrocytes form major components of this process. We have studied the changes in morphology and phenotyping of microglia and astrocytes in aging brain at critical age points in normal and peri-natally challenged rats. Microglia and astrocytes immediately react to perinatal stress and influence neuronal health. The impacts of such changes are dramatically different in animals exposed to early life challenges like infection, environmental hazards and malnutrition. We have recorded in the expression levels of MHC II, IL1 beta, IL6, TNF-alfa, GFAP and S100beta. A low level of neuroinflammatory state as seen in the "primed" microglia in the aging animals following early life challenges have also been recorded. We have also recorded early life challenges to influence the cognitive abilities.With our animal models we have strongly evidence to suggest that early life changes are involved in pathogenesis of some of the most debilitating mental illnesses of age.

- **Perinatal exposure of deltamethrin leads to persistent and permanent impairments in aging brain of rats**

Nisha Patro*, Kamendra Kumar and I.K. Patro***

**School of Studies in Neuroscience, Jiwaji University, Gwalior 474011, India*
*** School of Life Sciences, Jawaharlal Nehru University, New Delhi*

Exposure to neurotoxicants during early life is of great concern as they contribute to the increasing incidence of neurodevelopmental disorders. Escalating use of pyrethroid insecticides (a safer pesticide alternative) for residential pest control and public health and agriculture confirms wide spread exposure to these chemicals. Developing

brain is especially much more vulnerable to neurotoxic agents because of their immature nervous system and rapid rate of brain growth and diminished ability to detoxify exogenous chemicals. Once the neurodevelopment is disturbed there is a little potential for repair and it often leads to permanent consequences. We have tried to investigate the impact of low-level exposure to deltamethrin, a class II pyrethroid insecticide during perinatal life on the association between the cellular and molecular developmental events and the behavioral and cognitive abilities in rats at adulthood and senility. The maternal and the neonatal exposure studies were carried out by injecting deltamethrin at a dose of 0.7 mg/kg. body wt., 1/200th of the LD_{50} during critical windows of the brain development. Immunohistochemical, behavioral and cognitive studies were carried out in the pups born to the deltamethrin-exposed mothers and the neonatally exposed rat pups. The study revealed impairment in the proliferation and migration of granule cells, reduced and stunted Purkinje cell dendritogenesis, blockade of reelin signaling, inhibition of neurite outgrowth and reduced spine density, astrogliosis and astrocytic death as well as microglial activation in the developing and adult cerebellum. Such defects finally affect the physical maturation and sensorimotor reflex, cerebellar output in terms of hyperactivation and anxiety like behaviour along with impaired motor coordination and cognitive abilities. The above changes observed put a question mark on the use of these so considered "safe to human beings" pesticides in the environment of pregnant women, babies and children.

- **Interlinking telomerase, aging and cancer**

Deepak Mishra, Amod Sharma, Ramraj Prasad, Rishi Jaiswal and PramodYadava*

School of Life Sciences, Jawaharlal Nehru University, New Delhi 110067, India

It is necessary that actively dividing cells with linear replicons are equipped with telomere length restoration system to counteract the attrition of telomeres at each replication cycle. The default mechanism for this purpose consists of telomerase in all eukaryotic cells. Being essential for the cells, this enzyme system offers a good rallying point for signaling and gets connected with numerous allied functions. On the one hand it enables cells to divide over a prolonged period of time and on the other transformed cells reactivate telomerase function to acquire unlimited proliferation potential. We performed a genome-wide profiling of expressed genes following knockdown of telomerase. Both RNA as well as protein components of telomerase are associated with numerous functions other than telomere length maintenance. There seem to be positive association of hTERT with anti-apoptotic factors Bcl-2 and Bcl-xl. hTERT shows positive association with TranslationallyControlled Tumor Protein (TCTP) in cancer cells and a negative association in non-cancerous cells. TCTP has important roles and is required during neural crest formation in mammalian embryogenesis while it is differentially overexpressed and promotes epithelial to mesenchymal transition in metastatic cancer. We suggest that cell fate culminating in senescence and tumorigenesis is determined by a stochastic equilibrium of multiple determinants and due care should be exercised while attributing it to a single player like telomerase or TCTP.

Financial support received from UGC under University with Potential for Excellence is acknowledged.

- **Regulation of CaMKIIα expression by curcumin in aging mouse brain**

Vinaya Nand Dwivedi and S. Prasad

Biochemistry Lab, Department of Zoology, Banaras Hindu University, Varanasi-221005, Uttar Pradesh, India

Aging, an inevitable multifactorial irreversible process, is characterized by decline in cognitive abilities. Curcumin, the active ingredient of extract of *Curcuma longa* (turmeric) rhizome, has been used in the treatment of neurological disorders. Ca2+ signaling plays significant role in the glutamate signaling during memory consolidation and retrieval processes via glutamate-NMDA receptors/VGCC pathway and induction of Ca2+-Calmodulin dependent kinase IIα (CaMKIIα) followed by its downstream signaling leading to alterations in the expression of memory related genes, and has been implicated in several brain disorders. However, mechanism of the effects of curcumin on the recovery of age-associated memory decline is not well understood. In the present study, effects of curcumin on the expression of CaMKIIα, interaction of CaMKIIα promoter with CREB and association with the level of CREB in memory associated regions of the brain of young, adult and old male AKR strain mice have been analyzed. Our RT-PCR and Western blotting data reveal that CaMKIIα expression is significantly down regulated in the frontal and parietal cortices and correlated with decline in the level of pCaMKIIαThr286,

however, the pattern of its expression and its correlation with pCaMKIIαThr286 is opposite in the hippocampus during aging. Our EMSA data suggest that the above age- and the brain region-dependent alterations in the expression of CaMKIIα is associated with similar patterns of age- and brain region-dependent alterations in the interactions of CaMKIIα promoter with CREB, which further depends on similar alterations in the steady state levels of CREB in the brain regions included in study. The present finding on the modulation of CaMKIIα by curcumin might underlie its role in the recovery of age-dependent decline.

- **Nutraceuticals in healthy aging: relieving inflammation and oxidative stress**

Ramesh Sharma

Department of Biochemistry, North-Eastern Hill University, Shillong-793 022, INDIA

Aging is a universal and heterogeneous process exhibited in most living organisms. It encompasses progressive decline in cellular functions and decreased ability to cope with stressful conditions. With advancing age, there is a loss of physiological homeostasis leading to increased vulnerability to diseases and death. It results from multiple interactions between genes and environment in which the individuals live. There seems to be a strong correlation of epigenetic influence on aging and longevity. Inflammation and oxidative stress increase invariably during aging process. We have attempted to see the effects of nutraceuticals like curcumin andcapsaicin on the glucocorticoid receptor function and the protein carbonylation, makers of inflammatory and oxidative stress, in the mice as a function of age. These nutraceuticals offer a promising advantage in modulating glucocorticoid receptor functions and protein carbonyls in achieving healthy aging via their pivotal role in ameliorating inflammation and oxidative stress in experimental animals.

- **Metformin, as a caloric restriction mimetic, may be an effective anti aging drug**

Syed Ibrahim Rizvi and Geetika Garg

Department of Biochemistry, University of Allahabad, Allahabad

Introduction: Metformin, a biguanide, is a widely used anti diabetic drug which inhibits gluconeogenesis and is used to treat hyperglycemia in Type 2 diabetes. Molecular studies have shown that metformin activates AMP activated protein kinase which is also involved in caloric restriction health benefits. The resultant CR mimicking effect of metformin has been extensively investigated. The present study aims to examine the effect of short term metformin supplementation on markers of aging in blood and brain of male Wistar rats.

Material & methods: Young (4 months) D-galactose (500 mg/kg b.w. subcutaneously) induced and old (24 months) male Wistar rats were supplemented with metformin (300mg/kg b.w. orally) for 4 weeks. Biomarkers of oxidative stress such as antioxidant capacity (FRAP), lipid peroxidation (MDA), reduced glutathione (GSH) and protein carbonyl (PCO) were measured in erythrocyte, plasma and brain homogenate of control and experimental groups. Gene expression and histopathological studies were also performed.

Results: After 4 weeks of metformin supplementation, FRAP, GSH and PMRS activities were increased in all age groups compared to control. On the other hand metformin treated groups exhibited significant reductions in MDA and PCO level. D-galactose administration upregulated the expression of IL-6 and TNF-α while downregulate the expression of Beclin-1. Metformin supplementation downregulate the IL-6 and TNF-α expression whereas upregulate the Beclin-1 expression.

Conclusion: Our data confirms that metformin administration restores antioxidant status and improves healthy aging. Metformin also induced the protective autophagy pathways and simultaneously reduced the neuro-inflammation for neuroprotection of aging brain.

- **Morphological Changes in the human auditory pathway during aging**

T.S. Roy[1], Saroj Sharma[1], Charanjeet Kaur[1], Indrapal Singh[1], Sree Vani Poorna Pillutla[1], Dinesh K.T[1], Tony Jacob[1], Alok Thakar[2], Dayanand Bhardwaj[3]

[1]Department of Anatomy, [2]Department of Otorhinolaryngiology, [3]Department of Forensic Medicine and Toxicology, All India Institute of Medical Sciences, New Delhi.

Constant exposure to noise impairs hearing and its prevalence increases with age. Age related hearing loss may be due to morphological or neurochemical changes in the peripheral receptors or central auditory pathway. We have studied the various parts of the human auditory pathway during aging process. Temporal bone (cochlea and

spiral ganglion), auditory nerve and brainstem (cochlear nucleus, inferior colliculus) samples from human cadavers at various ages were processed for morphometry and immunostaining. There was significant reduction in the number of neurons in the spiral ganglion and a decreased expression of GABA and NMDAR-2B. In the cochlear nerve, the number of fibers was reduced with aging. Although the total number of neurons remains unchanged in the cochlear nucleus, a particular cluster of neuron was significantly reduced with aging. The number of glial cells in the cochlear nucleus increased with aging which was reflected in the GFAP immunostaining. The Ca-binding proteins were increased in the middle age but decreased in the higher ages. In the inferior colliculus expression of the GAD1 decreased with age. These results suggest that interplay of aging changes in the excitatory, inhibitory neurotransmitters and Ca-binding proteins are responsible for age related hearing loss.

Abstract

Health Sciences

- **Predictors of cognitive impairment in geriatric population: A study from Eastern India**

Abhik Sinha

Assistant Professor Community Medicine & Geriatric Health Specialist, R.G Kar Medical College, Kolkata

Backgound : Geriatric population in India which was 7.7% in 2001 became 8.14% in 2011 became 8.94% in 2016. Prevalence rates of dementia/cognitive impairment in India over the past two decades ranged from approximately 1.4% among those 65 years and older to 3.5% among those 60 years and older in rural settings. In urban settings, prevalence rates were reported as 2.44% among those 65 years and older. Thus its an important public health problem.

Objectives :To describe the sociodemographic profile of the geriatric population under study, To find out the level of cognitive impairment in them and to find out the association between cognitive impairment and certain pertinent clinicosocial variabales in the study population

Methodology : It was a descriptive study with cross sectional design done in the old age homes of Kolkata and rural areas of North 24 Parganas done in the time period of 4 years (2012 to 2016). The ethical clearance was taken from the concerned authorities . Sample size 868 was derived by the formula z^2pq/l^2. Scores of 25-30 out of 30 were considered normal; score 21-24 as mild, 10-20 as moderate and <10 as severe cognitive impairment. SPSS 20.0 was used for analysis .

Results: 7.1% of the geriatric population had cognitive impairment. Mild cognitive impairment was most common. MMSE score was found to be unrelated with gender, literacy, family type Hypertension and diabetes were found to be the significant predictors of the MMSE score in the study population after multivariate analysis

- **Palliative Care And Carer Issues In Dementia Patients**

Lt Col (Dr) Pradeep Behal

Classified specialist medicine and trained in geriatric medicine Base Hospital, Delhi cantt

Introduction: Dementia is paradigm of a chronic debilitating degenerative disease causing loss of memory neuron irrespective of the underlying cause. Life cycle of dementia starts from initial mild illness in form of forgetfulness to a full blown case with bedridden vegetative state over period of years.

Emotional roller coaster ride of dementia is well known fact not only for patients, but for relatives and primary caregiver also. This saga of dementia is more pronounced in later stages of dementia where palliative care finds important role in management of dementia. End of life care management in dementia patients is more stressful to carer than patient. EOLC in dementia is high responsibility work which can lead to mental and physical breakdown of carer. Tackling carer especially spouse in same geriatric age group is more challenging.

Experience on Issues of end of life care in advanced dementia cases and their caregiver as indoor patient in Palliative care centre in tertiary care centre over period of two years will be presented. Steps taken to enhance the QOL in advance dementia patient and to reduce caregiver stress will be highlighted. Feedback and knowledge enhancement of care giver will be shared.

Conclusions: EOLC in advanced dementia case is a daunting task which requires constant care, prolonged time, a lot of preservation and empathy towards patient and care givers. Socially and cultural acceptable norms of EOLC in dementia leads to better comfort to patient and lesser stress to caregiver.

- **Study of Prevalence of Diabetic Dyslipidemia in Elderly Attending OPD of Tertiary Care Hospital of North India**

Ravi kant[1], Manisha Naithani[2] , Minakshi Dhar[1], Monika Pathania[1], Venkatesh . Pai[1]

[1] Department of Medicine, [2] Department of Biochemistry, AIIMS Rishikesh

Background Cardiovascular diseases (CVD) are the foremost cause of morbidity and mortality in our society and with the advent of Type 2 diabetes mellitus (T2DM) pandemic the risk has escalated. Adults aged 55 and older are disproportionately affected by hypertension, dyslipidemia, and diabetes, which are established risk factors for cardiovascular disease (CVD). Although risk reduction strategies among older adults, including control of various risk factors, can lead to a decline in morbidity and mortality the prevalence of these risk factors has escalated in the past decade among elderly. The goal of this study was to ascertain the prevalence of Dyslipidemia among elderly diabetics in patients attending outpatient department of a tertiary care hospital in North India.

Material and Methods: The study was conducted from 31st December 2014 to 1st March 2015. 375 subjects out of which 155 (41.3%) were ≤ 50 yrs and 220 (58.7%) were with ≥ 50 yrs age group were selected from outpatient department of Medicine at AIIMS, Rishikesh. Dyslipidemia risk and impaired plasma glucose levels were classified as per National Cholesterol Education Program (NCEP) – Adult Treatment Panel (ATP) III guidelines and American Diabetes Association (ADA) respectively.

Results: The prevalence of mixed dyslipidemia (36.3%) was observed to be lower than single dyslipidemia (44.7%). The number of males (76) having mixed dyslipidemia was more than females (60). Among participants who had a total Cholesterol (TC) concentration ≥ 200mg/dl, high cholesterol levels were found is significantly higher number of females as compared to males. Similarly, high LDL cholesterol levels were present in significantly higher number of females. High density lipoprotein cholesterol (HDL-C) was abnormally low in 33% males as compared to 19.7% in females.

Conclusion: The low percentage of adults with controlled lipid concentrations suggests that there is a need for awareness programs for the prevention and control of dyslipidemia. Knowledge of cardiovascular health in older adults and understanding gender gaps in awareness can help physicians and policymakers improve disease management and patient education programs.

- **To Study The Prevalence of Vitamin B12 Deficiency in Elderly Population (> 60 Years) with Dementia Presenting to OPD**

Vivek Aggarwal, ChetanPanghotra, Sandeep Kumar

Armed Forces Medical College, Pune

Introduction Dementia is a common problem in the elderly with the prevalence increasing with age and approaching 20-40% in patients above 85 years of age. The vast majority of cases of dementia are degenerative or vascular in nature and are usually relentlessly progressive with few therapeutic measures for treatment available. There are only a few reversible causes of elderly dementia of which vitamin B12 deficiency is the most easily treatable.

Material and Methods All elderly patients (≥60 years) attending medical and veterans OPD were randomised and were screened for dementia using mini-cog tool. All patients with acute delirium, high dose vitamin B12 intake in last one year, alcohol dependence syndrome and blood transfusion in last 6 months were excluded. Patients with mini-cog of ≤ 3 were administered MMSE to see for presence of dementia and were included in the study. All the patients included in the study underwent complete blood count, MCV, HIV, VDRL, TSH, non-contrast computed tomography of the brain and vitamin B12 levels.

Results B12 deficiency was found in 7.5% of the dementia patients with B12 levels of less than 200 pg/dl. Borderline B12 levels (200-300 pg/dl) were found in 22.5% of the patients The duration of dementia in B12 deficient group was significantly less (25.1 months)than the overall duration of (39.4 months). The lowest MMSE was recorded in B12 deficiency group (16.13) whereas the irreversible dementias had better scores (Alzheimer's – 17.76 and vascular dementia- 18.67). A vegetarian diet was significantly associated with B12 deficiency with an odds ratio of 2.62.

Conclusion Prevalence of B12 deficiency in dementia was noted to be 7.5% whereas 22.5% of the dementia patients had borderline B12 levels. It is important to identify these patients as it can be a potential reversible cause of dementia.

- **An Anthropological Insight on Health Status, Nutrition and Ageing in Pondicherry, India**

Ajeet Jaiswal

Assistant Professors, Department of Anthropology, Pondicherry University, Puducherry-605014

The present study examined the relationship among body composition, measures of self-rated health and activities of daily living in a group of free living elderly aged >60 years belonging to poor economic status. A sample of 147 subjects (84

males, 67 females) from Pondicherry, India was selected. The subjects were divided into three age groups i.e. 60-69, 70-79 and >80 years for comparison. Mean height, weight, circumferences of waist and hip and WHR were higher in males than females with no difference in BMI. None of the anthropometric variables showed significant association with age. Majority of the subjects rated themselves as 'poor' or 'fair' self-rated health and this corresponds well with the lower mean values of anthropometry as well as activities of daily living, well-being and memory and cognitive function, impaired health aids and in general health. Polytomous logistic regression showed that subjects with the highest score on well-being compared to the lowest score rated 0.325 times (CI: 0.124, 0.851; P<0.05) good vs fair. The odds ratio was 0.519 times (CI: 0.206, 1.306) between good vs poor. Subjects who rated their health as good/fair tended to have BMI in the normal range. In the poor self-rated health group a maximum of 55% of males and 47% of females were below 19 units of BMI, which was reflected in the increase in odds ratio of 1.361 in males and 1.134 in females between good vs poor health ratings. The findings reveal that well-being and BMI are related to self-reported health status.

- **Cardiovascular profile of elderly patients attending geriatric clinic**

Avinash Chakrawarty, A B Dey

All India Institute of Medical Sciences, New Delhi

Introduction- The elderly represent the most rapidly growing population group world wide. Cardiovascular disease, the major cause of death and disability in the elderly. As age advances spectrum of disease changes as compared to young adults.

Objectives of study- To assess the cardiovascular spectrum of disease in patients coming to geriatric clinic.

Methodology- Cross sectional study Out patient and in-patient services of the Department of Geriatric Medicine**.** Patients included based on clinical features suggestive of cardiovascular diseases and were assessed on basis of echocardiography.

Results- 500 patients from geriatric service were taken and assessed for cardiovascular profile. Diastolic dysfunction is seen in most of individuals. DCMP is also more common.

Discussion- As Ventricular filling depends upon the venous return and the complianceof the ventricle during diastole. A reduction in ventricular compliance, as occurs in ventricular hypertrophy will result in less ventricular filling (decreased end-diastolic volume) and a greater end-diastolic pressure. As age advances there is decrease in compliance of cardiac muscles resulting in diastolic dysfunction.

Conclusion- Most of the cardiovascular morbidity is mainly due to non-valvular cardiac causes as compared to young adults.

- **Frailty incidence in an Indian community-dwelling population**

David Hewson, Jennifer Bassement, BrajeshKumar Shukla, Sandeep Yadav, Vivek Vijayvargiya, Arvind Mathur

Professor, University of Bedfordshire, Luton, England
IIT Jodhpur, Asian Centre for Medical Education Research and Innovation, Jodhpur

Introduction: Frailty is an increasingly common problem worldwide, however there have been few studies of frailty in India. The most widely-used method to detect frailty is the Fried criteria, which classifies people as frail, pre-frail or non-frail according to five different assessments.In a previous study of hospitalised older people in India, the incidence of frailty was 32% according to the Fried criteria, while in another study in which grip strength wasn't measured, an incidence of 11% in community-dwelling older people was reported.

Material & Methods: Community-dwelling older subjects were screened for frailty using the Fried frailty scale. In total 103 subjects were tested, (77 men and 26 women) with subjects aged 70.2 ± 5.4 y, with an average height of 1.62 ± 0.09 m and weight of 70.7 ± 15.1 kg.

Results: The incidence of frailty was 15% according to the Fried criteria, with 49% of subjects classified as pre-frail and 36% of subjects as non-frail. When the five criteria were assessed individually, 46% of subjects were frail for grip strength, 36% for physical activity, 18% for exhaustion, 14% for gait velocity, and only 9% for unexplained weight loss.

Conclusions: The population studied has similar incidence of frailty to that found in other countries. However, there was a wide difference in the incidence of frailty for the individual criteria. Such a finding could suggest that the thresholds for frailty according to the Fried criteria could be reassessed to suit an Indian population.

- **Screening for fall-risk in an Indian community-dwelling population**

David Hewson, Jennifer Bassement, BrajeshKumar Shukla, Sandeep Yadav, Vivek Vijayvargiya, Arvind Mathur

Professor, University of Bedfordshire, Luton, England
IIT Jodhpur, Asian Centre for Medical Education Research and Innovation, Jodhpur

Introduction: Screening for fall risk is a routinepart of geriatric assessment. The tools used for screening vary, with physical tests such as the Timed-Up-and-Go (TUG)and the One Leg Stance (OLS) widely used. Fear of falling has also been shown to predict fall risk, with the most widely used questionnaire being the Falls Efficacy Scale International (FES-I). The aim of this study was to compare the ability of screening tools for falls to discriminate between fallers and non-fallers in an Indian population.

Material & Methods: One hundred and three community-dwelling subjects(77 men, 26 women) aged over 60 y (70.2 ± 5.4 y) were screened for fall risk. Subjects had average height of 1.62 ± 0.09 m and weight of 70.7 ± 15.1 kg. Screening tests included TUG, OLS, and the FES-I. The relationship between the screening toolsand falls historyin the previous 12 months was assessed.

Results: Only 11% of subjects reported a fall in the previous 12 months. The risk of falls was low according to the TUG (11% of subjects) and the OLS (25%). The number of subjects with high concern about falling according to the FES-I was 47%.Subjects that had high concern of falling according to the FES-I were more likely to have fallen in the previous year ($p<0.05$).

Conclusions: Fear of falling was related to a previous history of falls, however the population studied was unexpectedly robust, with the incidence of falls roughly one third of that expected in community-dwelling older adults.

- **Medical management of diabetes in elderly: Focus on newer oral hypoglycemic agents**

Monica Gupta

Professor General Medicine, Government Medical College and Hospital, Chandigarh

Diabetes in elderly is a heterogeneous clinical condition comprising of multiple co-morbidities, cognitive dysfunction and functional disabilities. The age-related or disease related changes in the functioning of the liver, kidneys & the cardiovascular system may alter drug kinetics thereby increasing the incidence of adverse drug events and drug-drug interactions. In addition, underlying depression and dementia are linked with difficulties with self-management and poor compliance, leading to poor glycemic control. Overall aim in elderly is to reduce or delay the complications of disease which may cause disability, loss of independence and early institutionalization and to improve or at least sustain the functionality/ quality of life. Management goals are individualized based on the needs, resources and life expectancy without rigid adherence to protocols.

- **Development of services for older people in Australia**

Leon Flicker

Professor of Geriatric Medicine, Western Australian Centre for Health & Ageing, Centre of Medical Research, University of Western Australia

Australia is fortunate to have a relatively integrated system between acute health care, residential aged care and community care. A major impetus for this integration was the acceptance by the Australian Government in 1963 for a large proportion of the funding for residential care. Following, an exponential increase in the number of nursing home beds occurred and to curtail these escalating costs, an independent assessment was required before older people were placed in residential care. This was performed by multidisciplinary teams, Aged Care Assessment Teams (ACATs), which have strong links with state-funded regional geriatric teams.

Other features of the Australian system include universal coverage for health care and residential aged care. After subsidization of residential care occurred, it was realized that often older people could be supported in their own homes at lower costs than in residential care. Thus government has invested in the subsidization of community care using the Home and Community Care system and an expanding pool of Australian Government packages although assessment for this sector has become more challenging.

The interdependence of each part of the system has become apparent, mainly through crises provoked by relatively minor system changes without fully considering the downstream ramifications. Because older people often require a period of rehabilitation after acute illness there has been increased provision of subacute care, both inpatient and outpatient, which supports inter-

connectedness by assessment and triage. Transition care has been added to this system to bolster, not replace, the subacute care system. Challenges remain including the need for geriatric medicine to have greater involvement in acute as well as sub-acute medicine.

- **Preventing Dementia**

Leon Flicker

Professor of Geriatric Medicine, Western Australian Centre for Health & Ageing, Centre of Medical Research, University of Western Australia

It is currently unclear, but in parts of the developed world there may have been a reduction in the age-specific incidence for dementia, coinciding with a reduction in cardiovascular disease events and hip fractures. The cause of this is uncertain. There are currently two broad strategies being evaluated to prevent dementia. The first strategy is based on targeting lifestyle factors where it is hoped that individual interventions will be modestly effective and have minimal risks and costs. The second strategy is based on the concept of identification of very susceptible individuals and then intervening with highly efficacious anti-Alzheimer disease agents, which hopefully will have acceptable side-effects and costs. The latter strategy is, as yet, totally undeveloped but there is increasing evidence that some lifestyle factors are linked to the development of cognitive decline, dementia and Alzheimers Disease.

Currently available information particularly favors the cessation of smoking and increasing physical activity as ways of decreasing the risk of deterioration of brain functioning. Other potentially modifiable lifestyle factors include education, social engagement, cognitive stimulation, and diet. Interventions that target these lifestyle factors have numerous other health benefits and thus recommendations apply almost universally for people from middle age and beyond. The evidence for the benefits of these lifestyle changes is not conclusive for the prevention of dementia but it is unlikely that definitive trials will be performed, and that health promotion activities based on these lifestyle factors will be utilized to decrease the burden of dementia faced by the world's rapidly ageing populations.

- **What does the Study of Older Men Teach us about Ageing?**

Leon Flicker

Professor of Geriatric Medicine Western Australian Centre for Health & Ageing, Centre of Medical Research, University of Western Australia

There is still a dearth of evidence as to what factors increase the ability for people to live to a healthy old age, particularly for those people who have already entered the transition into their older years. The Health In Men Study included men aged 65-79 years identified in 1996, and 12,206 attended. Extensive questionnaires, physical and blood measurements have been accumulated as well as linkage to hospital, morbidity and mortality datasets.

A number of findings have come from this study. We demonstrated that three quarters of men reaching the age of 80 years had aged successfully in mental health and a greater degree of education and physical activity were associated with an increased chance. We showed that the association between BMI and 10-year mortality was U-shaped with the lowest risk amongst those with BMI between 25 and 29.9 (overweight range). There appears to be an interaction between age of onset and duration of diabetes such that the older the age of onset, the lower the increase in mortality for a given duration of diabetes.

As men grow older, the prevalence of ill-health increases while circulating testosterone (T) levels decline. We demonstrated that lower T levels are associated with impaired cognition and depressive symptoms in older men and were independent predictors of reduced sexual activity, cerebrovascular events, and all-cause and cardiovascular mortality. We have also shown that although frailty is associated with attrition, our ability to follow people through administrative datasets allows us to determine effects relevant to the entire population.

- **Clinico- epidemiological profile of scrub typhus among older patients in a tertiary care hospital in South India**

Gopinath KG, Beulah P, Rakesh M, Prakash JAJ

Christian Medical College, Vellore

Introduction- Scrub typhus, an emerging infectious disease in India has been well studied in the younger population. However, studies in older people (>60 years) are lacking.

Materials and Methods- We performed this retrospective review of 462 patients with

microbiologically proven Scrub typhus between May 2005 and Dec 2015 in Christian Medical College, Vellore, South India.

Results- There were 216 (47%) patients less than 65 years,180 (39%) were between 65 and 75 years while 66 (14%) patients were above 75years. Overall, the mean duration of fever was 9.23 ± 4.09 days. Fever was absent in 8 patients. Delirium was noted in 144 (31%) of patients. The mean haemoglobin was 11.3 ± 2.3 gm%. The mean protein and albumin levels were 6.394± 0.83gm%and 2.6906±0.63gm%. Mean creatinine was 1.7 ±1.3 mg%. Compared to patients with eschar, those without eschar had a significantly lower total count and higher total protein levels (p=0.02) and a higher likelihood of needing intensive care unit stay (p=0.03).Overall, there were 38 (8%) deaths. There was no difference in mortality between those with and without eschar (p=0.20). Mortality in our study was comparable to data from previous studies.

Conclusion- Scrub typhus is a common infection among the elderly with mortality comparable to the younger population. The presence of eschar does not have prognostic value in scrub typhus in the elderly population.

- **Potentially Inappropriate Medication use in elderly in a tertiary care centre in South India**

Dr Pranita Roy, Dr Alwyn Christopher , Dr Prasad Mathews

Department of Geriatrics, CMC Vellore

Introduction - Elderly patients have multiple comorbidities requiring treatment. Drug prescription plays an important role in the care of the elderly. Inappropriate prescribing is considered a major public health issue, given its direct association with substantial morbidity, mortality and health service costs that result from adverse drug reaction. The aim of our study was to estimate the prevalence of inappropriate medication use in hospitalised elderly, as defined by Beers Criteria 2012. We also looked at the risk factor associated with the use of potentially inappropriate medications.

Materials and Methods - This study was done from April 2013 to August 2014 in the department of Geriatrics of a tertiary care centre in South India. Demographic parameters, comorbidities, pharmacokinetic parameters, cognitive and functional status and details of drugs (over 2 weeks) were collated.

Results - Total of 280 hospitalised patients were included. The prevalence of potentially inappropriate medication use in our study was 33.2%. 70% of population was found to be using one potentially inappropriate medication. The most common drug was benzodiazepines in 19.5%, followed by antimuscarinics in 13.6% and antipsychotics in 11.9%. Age, functional status and depression were found to be independent risk factors for potentially inappropriate medication use.

Conclusion - Our study showed high prevalence of inappropriate drug use in elderly which is consistent with many Indian studies which have reported prevalence of 20 – 30%. Effective intervention to optimise drug prescribing in elderly is therefore needed to prevent adverse drug reactions, drug interactions, cognitive impairment, falls and mortality.

- **A case study of haemorrhagic CVA and comatosed patient treated with Ayurvedic Panchakarma therapy & Marma massage**

Sanjib Kr Samanta, Roudri Samanta, Mani, Imtiaz, Rahul

Introduction: Ayurvedic Panchakarma therapy & Marma massagae used in various treatment can give unique result.

Material & Methods: A patient was diagnosed haemorrhagic CVA, SIRIS & hypertension by Nabajiban Hospital, Kolkata. CT scan of brain showed that right cerebral hemisphere showing a moderate sized acute intracerebral haematoma at upper frontal and frontoparietal-parasagittal white matter and crotical region along right anterior basal ganglia and paraventricular region with rupture into right lateral ventricle producing associated acute intraventricular haemorrhage. Thin chink of acute subdural haematoma noted along right lateral border of the interhemispheric falx extending more anteriorly.No improvement found within 24 days.Then the patient was treated by us with Marama Massage on head follwed by Shirodhara with medicated milk & nasal infusion (Sangasthapana Nasya) for 7 days.

Results: On 2nd day after therapy the eyes were blinking and opened.After 4 days sound responded and after 7 days slightly improvement of facial movement along with right sided hand and leg movement. Repeated CT scan showed-right sided cerebral hemisphere-a small residual sub acute haematoma at upper frontal and front oparietal parasagittal white matter region produ-

cing mild compression on the roof of the right ventricle, lateral ventricle were mildly dilated, but the intra-ventricular haemorrhage was almost completely disappeared. Thin chink of acute subdural haematoma was noted completely disappeared.

Conclusion: The said marked improvement signifies great hope on CVA & comatose patient. Further study is required.

- **Neural pathway for pain – its alteration with age**

S B Ray

Deptt. of Anatomy, AIIMS, N Delhi

Prevalence of persistent pain significantly increases in older persons. Peripheral terminals of A-delta and C groups of nerve fibers called nociceptors detect any tissue damage. As a result, action potentials are generated, which are carried to the CNS. Incoming nerve signals are modulated by several mechanisms like the gate control system as well as the descending pain modulatory pathway. The latter is impaired in older adults and consequently increases the sensitivity to moderate to severe pain. In contrast, sensitivity to acute pain is decreased with advancing age like in myocardial infarction, peritonitis or pneumonia. It may be related to decreased functionality of the A-delta and C fibers. However, in the brain, the gray matter associated with discriminatory aspects of pain sensitivity like in the insular cortex and the primary sensory cortex, is preserved with advancing age. On the contrary, patients with fibromyalgia demonstrate gray matter loss. Evaluation of pain in older people is thus a complex issue, particularly, in the presence of co-morbid conditions. Overall, adaptation to pain is compromised, producing increasing vulnerability to pain. Further research is required to unravel the neurobiology of aging from that of pain. It could lead to better management of pain in the elderly.