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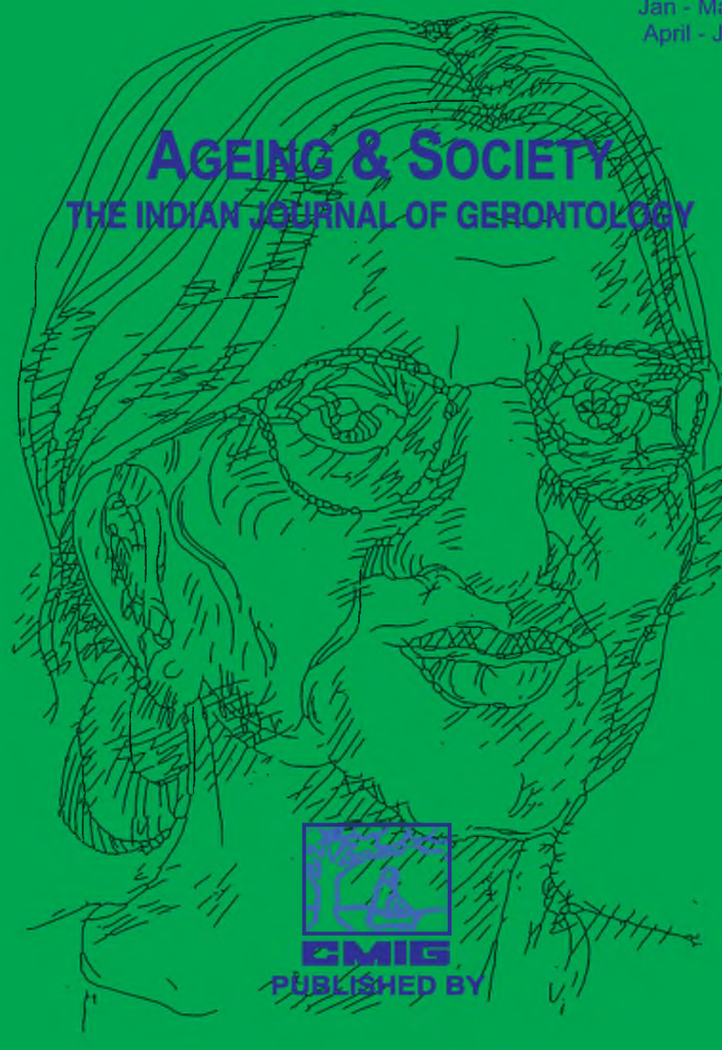
AGEING & SOCIETY

THE INDIAN JOURNAL OF GERONTOLOGY



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CONTENTS

THIS JOURNAL PUBLISHED REFERRED ARTICLES ONLY

AGEING & SOCIETY : THE INDIAN JOURNAL OF GERONTOLOGY

Editorial Board

This Journal will be devoted to papers on the following aspect of human ageing

- ★ Social Gerontology
- ★ Biology
- ★ Medicine
- ★ Behavioural Science

In addition we welcome Abstracts, Book reviews & Interviews with senior citizens

NOTES FOR CONTRIBUTORS

All Contributions and correspondence should be sent to Dr. Indrani Chakravarty, Calcutta Metropolitan Institute of Gerontology, E-1, Sopan Kutir, 53B, Dr. S. C. Banerjee Road, Kolkata-700 010. Contributors are requested to conform to the following norms and those articles that do not conform may not be considered.

Journal articles that deal with the biological, medical, psychosocial, service or other aspects of ageing are welcome.

Articles should be original contributions. Redundancy is discouraged. The articles should be written in English are free of grammatical, spelling errors, repetitions etc.

Articles shall contain: A brief introduction (reflecting the context, the review of relevant work and why the present study was planned) : relevant details of plan methodology, sample, (including standardization properties of tools) etc., the results or findings and their discussion and conclusions arrived at. At the beginning of the article the title and names of authors shall be mentioned. (Their affiliation may be given at the bottom of the page). This shall be followed by a brief abstract of the article (not exceeding 100 words) in single space, bold and set off the margins (inset by two spaces). Two or three key words of the article should also be provided at the end of the abstract separately.

Articles may be computer generated. Two hard copies, double spaced in A4 size (one side only) with wide margin may be sent. The articles would be adjudicated by referees and the result would be communicated. When the article is accepted contributors are requested to send 2 corrected versions of the article (hard copies) and the same in an electronic version in CD, press ready.

(a) References as below in international style (e.g. journal of Gerontology) arranged in alphabetical order in the Text : (Altekar, 1973,

Birren, 1959, Tyson 1983 ....). End list of references:

Baltes, P. B. (1987). Theoretical propositions of life-span developmental psychology: On the dynamics between growth and decline. *Developmental Psychology,* 23,611-626.

Baltes, P. B. Reese, H. W., & Nesseiroade, J. R. (1988). *Life-span Developmental Psychology: Introduction to Research Methods.* Hillsdale, NJ : Eribaum.

(b) Footnotes should be avoided unless absolutely essential.

(c) Tables and figures should be clearly laid out, typed in standard format, numbered consecutively, and designed to fit on the page of the Journal "AGEING & SOCIETY" of CMIG.

D-GALACTOSE INDUCED ACCELERATED AGEING A BRIEF REVIEW

B K Patnaik *

ABSTRACT

Chronic exposure of house flies, fruit flies, rats and mice to D- galactose cause acceleration of ageing, The major changes include shortening of life spans in flies, increase in oxidative stress, neuro degeneration, mitochondrial dysfunction, loss of immune function and disorder in gene expression in mice and rats.

The above cited observations simulate the changes associated with natural ageing. They also provide support to two important theories of ageing i.e free radical theory and glycation theory.

* Retired Professor, Plot No. - 2197, Canal Road, BJB Nagar, Bhubaneswar - 751014

The Study of process of ageing can be approached in various ways. In cross-sectional study, animals of different ages (young, middle aged and old) maintained in a colony are used to estimate the selected parameters. On the other hand the same young animals/human beings are chosen for the study of age-related parameters at specific intervals such as weeks , months or years with the advancement of age. Such a method is termed as longitudinal study. Gerontologists are also interested to evaluate alterations associated with premature ageing resulting from inherited genetic defects in Progeria Werner's syndrome and Down's syndrome.

In order to avoid long period of study associated with the lifespan, of species, premature ageing models such as senescence accelerated mouse (SAM), MnSoD knock out mice and telomerase knockout mice have also been developed.

Another approach deals with induction of ageing in young animals by administering certain chemicals chronically . This results in accelerated form of ageing.

D- **Galatose as inducer of ageing**

Recent observations indicate that syetemic exposure of house flies, rats, mice and fruits flies to D- Galactose causes acceleration of ageing (Ho etal 2003, Cui etal, 2004)

D-galactose is a reducing sugar normally present in the body. It combines with glucose to from lactose of milk. It is also associated with compound lipids and glycoproteins. It is converted to galactose 1 phosphate with the help of the enzyme galactokinase. Conversion of galactose 1 phosphate to glucose 1 phosphate requires an enzyme ,Galactose 1 phosphate uridyl transferase. Lack of either of these enzymes due to inherited defects leads to accumulation of D-galactose in the blood. Such a condition known as galactosemia is characterized by liver and renal failure and mental deterioration in children (Murray etal, 2000,Tsakaris etal, 2005).

Exposure to D·Galactose :

The dose, duration and mode of treatment with D-galactose differed depending on the species of animals studied and their age

1. While in case of housefly D-galactose was added to drinking water (20 mg/ml),it was included (6.5%) in culture medium of fruit fly.

2. Rats & Mice were given subcutaneous injection of D-galactose daily, the dose varying between 50 to 100 mg/kg. body weight. The duration of treatment was 4-5 weeks or more.

Changes in salient parameters following chronic exposure to D- galactose:-

1. D-galactose caused a significant decline in mean and maximum life spans of both housefly and fruitfly (Cui etal, 2004)

2. It caused behavioral impairment in mice (Wei etal, 2005)

3. Loss of neurons and alterations in neurological activity were observed in mice (Cui etal, 2006)

4. It caused mitochondrial dysfunction in mice (Kumar etal, 2009)

5. Alterations were observed in biochemical parameters of oxidative stress caused by free radicals

Lipid peroxidation increased and antioxidant enzymes decreased in the tissues of D-galactose treated mice, housefly and fruitfly(Cui etal, 2004,Lu etal, 2006)

6. There was a decrease in immune function in mice (Miao etal, 2009)

7. Abnormal expression of genes involved in transport and protein synthesis was observed in hippocampus region of brain of mice (Wei etal, 2008)

Mechanism of action of D- Galactose

When present in excess D-galactose is oxidized to aldehydes and hydrogen peroxide (H_2O_2) by the enzyme galactose oxidase. Subsequently free radicals are formed ($H_2O_2 \xrightarrow{e + H^+}$ OH; hydroxyradical) D-galactose also reacts with amino group of free amino acids and proteins (glycation reaction) leading to the formation of advanced glycation end products (AGEP) which accumulate in the body (Song etal,1999).

Both free radicals and AGEP are known to damage the cellular structure and function leading to cellular ageing and pathogenesis of many age-related diseases.

The observations support two important theories of aging.

Harman (1956) first proposed that short lived Oxygen free radicals might be an important cause of ageing. Subsequent experimental evidences have supported the free radical theory of ageing (Harman 1992, Halliwell and Gutteridge, 1997, Ames and Shigenega 1992).

The glycation theory of ageing was advocated by Cerami, 1985. Advanced glycation end products (AGEP) cause modification of cellular constituents. Increase in such modification with advancing age may be one of the causes of ageing. It has also been reported that AGEP produce free radicals. Thus there is synergetic interaction of free radicals and glycation (Yu, 1993)

Concluding Remarks

D- Galactose induces mimetic ageing in experilnental animals. This appears to be a suitable model to understand the mechanism of ageing process because the D- galactose treated animals demonstrate, the hall-marks of natural ageing. Some gerontologists are now using natural antioxidants from plants (Polyphenols, anthocyanins) as antiageing agents to revert the D- Galactose induced ageing changes (Lu etal, 2009)

Acknowledgement

Thanks are due to my student Dr. B.S Jena Scientist, Institute of Minerals and Materials Technology, Bhubaneswar.) for supplying me with the reprints of articles quoted in reference section.

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SLEEP LAB TRIALS WITH ELDERLY

Indrani Chakravarty
Dola Bhattacharjee(Gupta)
Ipsito Chakravarty

ABSTRACT

This paper deals with one of the prime themes on technology intervention for the issues of the elderly. In the sleep lab trials, efficiency of sleep for elderly respondents' were measured. In the follow up repercussions of sleep issues are estimated. From the scores (pre-designed) in the assessment, change in the behavioural pattern of the respondents is the important outcome of the trials.

Key Words: Technology, Sleep, Elderly

Research Team of Calcutta Metropolitan Institute og Gerontology (CMIG)

INTRODUCTION

This paper is a part of the project work in Gerontechnology Lab at Calcutta Metropolitan Institute of Gerontology CMIG. This project has various dimensions, the paper deals with smaller but very important area- sleep issues of the elderly and the repercussion in day to day life.

What is Gerontechnology?

Any technology directed to use for the elderly population in positive sense is Gerontechnology. As a matter of fact, life on the earth is very much defined and shaped till now by the impact of Industrial Revolution, more than 250 years old. The way we eat, attire, our ambience around- the light,fan,chair,table an all came out of the technologies emerged by the wonders of industrial revolution. It may be appreciated that countless products of the industrial revolution have added to the life of the older persons and also to their comforts. Even the simplest device, walking stick properly designed would help a older person in advancing years in many ways. Life saving medicine/medical intervention added to the longevity. All these happened in the rhythm of sustained growth of development of the human civilization since that advent of prime movers before 250 years.

Gerontechnology is a term in use particularly by a scientific community dealing with the ageing and the aged since the beginning of 21st century. What could be the reason?

With the dawn of the new millennium, a new industrial revolution was born by the marriage of two technologies- computer and communication. The product is Information and Communication Technology (ICT). It is now commonly accepted that, ICT has that potential to do meet the challenges of many issues in the world. Logically, it should be able to deal with the issues of ageing as well. In course of preparing this paper, it is the reviewed that most of the

published materials are converging upon that creation of Assistive Living conditions for the elderly. Description of a smart home [1] is a very common. Surprisingly use of technology to the diagnosis the problems common to most of the older persons is not being incorporated in the literature of Gerontechnology for unknown reason. One reason might be attributed to the space and distance within which high-tech medical appliances are being used.

ICT revolution in the 21st century has contributed all pervasive communication networks. This is the major breakthrough by which high-end applications of life like money transfer, health check-up, entertainment and recreation can be accomplished any where, everywhere, anytime and possibly by anybody.

In India, it is mobile revolution now. 99% of the habitat is under the coverage of mobile network. 85% of 65+ owns mobile phone [2-4] in this scenario, scope of Gerontechnology is widening by yet another dimension. If the network is available for communication for data medical diagnosis could be done for the masses cheaply and effectively

This paper aims at presenting some of the findings from the ongoing project of Gerontechnology at CMIG. on "Age-Related Increase in Awakenings".

Technology used

In this study 'sleep lab' in Android Platform has been used. This is a mobile based application and easy to use. But highend mobile set is essential for using this application. How the application works?

When a person starts sleeping, his/her body temperature decreases, reaching the minimum when the sleep is sound. Again body temperature starts rising when the sleep changes goes from sound to light sleep phase. In the Fig-1 the Blue Zone indicates the duration of sound sleep. As the blue zone is large, duration of sound sleep is large. Sleep problem are common in elderly[5]. Older people need sleep less than younger people but their sleep is less deep and choppier than sleep in younger people. In this study, it is found that a healthy 64 years old man wake up four times during the night without it being due to disease. Sleep Lab in our project can be adjusted with the time of sleep just like alarm clock and then it should be placed in reverse direction at the bed closer to the body. When the schedule time measurement is over Sleep Lab is capable of generating very indicative results and drafts. Results in this paper is based on Sleep Lab experiment conducted repeatedly over three months for one particular older person male, at 69, otherwise healthy. His medical record indicates that neither he suffers from high sugar, blood pressure nor any chronic disease. His normal trend of a sleep is shown at Fig-1 with significant awakenings and light sleep durations.

Figure-1

When ambience was improved by temperature control, aroma and very light massage before the bed, significant improvement of deep sleep zone was noticed; Fig-2. On another occasion he was given sedative drug under medical advice; Fig-3. Under this situation deep sleep was nearly 87%.

Figure-2

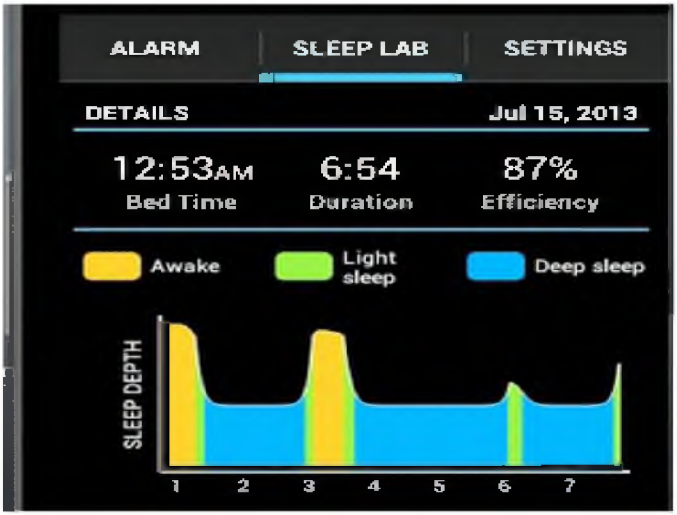

Figure-3

Results of the Behavioural Data are indicated in the Table

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REPURCUSSION OF GOOD SLEEP AND BAD SLEEP FOR OLDER PERSON-

- It is observed that when the efficiency of good sleep falls below 80%, our respondent remains highly or partially depressed during the next day.

- Although, he is able to perform most of his essential activities, he avoids the finer parts of life-no humours, doesn't pursue his hobby of writing and often causes irritation in the family by his role in thespian model.

- Performing normal activities is a matter of habit but choppy sleeps takes away the alertness of the mind. As a result, the person may develop mobility issue by way of wrong steps in the stair-case, roads and slippery toilets.

- Forgetfulness is common, losing wallets, specs and mobile phones are common examples.

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MEASURES FOR ELDERLY : PSYCHOLOGICAL PERSPECTIVE

M Sunil Kumar*
Anindita S Roy**
Debastuti Baruah***

ABSTRACT

Aging is a dynamic process, with shifts in magnitude of what contributes to the. aging process. The problems related to old ageare multifaceted which can be broadly categorized as Physiological: Health, Social: Social and Physical Security Economic: Financial Security, Psychological: Generally the effect of personality characteristics like individual differences, gender differences, traits, goals and motives, emotions, self evaluative processes, self-concept, coping strategies, and well-being, Abuse of the Elder Persons and Victimization, Guardianship in case of Incapacitated Adults. This article is aimed at discussing the probable measures to be implemented to deal with these problems. Counselor plays an important role in improving psychological wellbeing of the elderly.

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** Resource Person National Institute of Social Defence R.K Puram New Delhi Psychologist and Cousellor

** M.A(Clinical Psychology)

INTRODUCTION

Aging is a dynamic process, with shifts in magnitude of what contributes to the aging process. The genetic background, individual heredity, environmental factors -both physical and social, and our behavior contribute towards attaining old age. Broadly speaking, aging is a product of ecological forces. Aging is a complex phenomenon, especially in case of human beings where many factors interact. On one hand, human life expectancy has increased dramatically in the recent times due to better housing, public health, nutrition, and successful treatment of many common infectious diseases whereas it is also a fact that old age brings many changes in the life of an individual. There is a large diversity among older individuals in respect of their inner experience and interpretation of their lives, behavioral changes, gender differences which need to be paid attention in order to make the life of older people meaningful and joyful.

PROBLEMS RELATED TO OLD AGE

The problems related to old age are multifaceted which can be broadly categorized as:

1. Physiological: Health

2. Social: Social and Physical Security

3. Economic: Financial Security

4. Psychological: Generally the effect of personality characteristics like individual differences, gender differences, traits, goals and motives, emotions, self evaluative processes, self-concept, coping strategies, and well-being.

5. Abuse of the Elder Persons and Victimization.

6. Guardianship in case of Incapacitated Adults.

All these factors are interrelated and cannot be divided into

watertight compartments. Onset of any of these problems may cause the onset of another problem. While conceptualizing any counseling program for the elderly persons, contribution of all these factors should be assessed in totality and not individually in order to have an effective and successful impact on the individual for whom it is meant.

Following are some of the researches done to show the problems of the elderly.

K. Pappathi and M.A. Sudhir in their article *"Psycho-Social Characteristics and Problems of the Rural Aged"* conducted a study to understand the problems of the elderly women living in rural India. The study was conducted among various villages of Tamil nadu. It was found that the most common physical problems are impairment of vision, hearing and locomotors ability. Their socio economic condition is very poor and they suffer from anxiety, worries, lack of motivation, tension, and lack of affection from family members. They are also confronted with physical strain, sleeplessness , backache, loss of vigor, giddiness and difficulty in walking.

Boralingaiah.P , Bettappa.P & Kashyap.S (2012) conducted a research to find out the prevalence of psychosocial problems in elderly population in Karnataka. It was found that 10.6% of the family were found to have apathy and negative reaction on illness of elderly, 50.8% of the aged had financial burden, 10.6% of the elderly had conflict. Living with children (56.8%) is the most preferred arrangement in the present study followed by living independent (21.5%), spouse (20.2%) and relative (1.5%). Elderly females had more of this feeling than males. In the present study moderate and severe functional impairment was found to be 19% and 4.6% respectively. Male respondents were noted to be more functional than female respondent. Functional score was observed significantly higher for younger old than older old, for illiterates than

literates, for middle class than lower class and for employed than unemployed. Prevalence of psychological disorders among elderly population observed were somatic symptoms 2.9%, anxiety and insomnia 3.4%, social dysfunction 1.5% and severe depression was 1.1%.

A survey done by Helpage India (2013) found that 23% of elderly reported of abuse annually. The most common form of abuse is disrespect, verbal abuse, neglect, beating or slapping .Nationally the daughter- in -law is the main perpetrator of abuse followed by son. The main reasons include lack of adjustment or economic dependency of the elderly. Finally maintaining confidentiality of family matter is the primary reason for not reporting of such violence in police station.

In the following section effort will be made to discuss these aspects.

PROBABLE MEASURES TO MINMIZE THE ILL EFFECTS OF THESE PROBLEMS ON THE AGING PERSONS

Physiological: Health

The later years of life bring physical changes that may or may not be alterable. Some are normal changes due to aging and others are caused by illness, or cognitive decline. Some of these changes are gradual and others are abrupt and introduce unexpected changes to the self. Any type of illness brings dysfunction, and efforts to overcome these changes require complex and most of the time debilitating treatments. Illness induced functional decline and perceived stigmatization may lead to withdrawal from social roles and reduction in economic resources. The reductions in physiological functions and participation in daily activities are associated with increase in negative affect and decline in positive affect. Briefly it can be said that functional decline caused by both the onset of old age and illness give rise to psychological hazards which will reinforce the very functional deficits that initiated them.

The maintenance of good health is a life span issue and, therefore, *the elderly persons can be counseled to help themselves to tackle such problems by adopting and sustaining to health promoting behavior as it is clear from the studies that a number of health behaviors can enhance physical and psychological well being.*

The questions are – Can health promoting behavior minimize the physical and psychological burdens of aging and illness? What type of health promoting behavior will help the elderly? What will motivate the elderly to adopt and sustain the health promoting behavior?

The answer – Health promoting behaviors can improve physical and psychological functions and well-being and in some cases, reduce vulnerability to disease and/or slow disease progression. The health promoting behaviors include regular exercise, no smoking, appropriate weight according to age, normal sleeping hours, diet rich in fruit and vegetables, regular medical check-ups etc.

Maintaining the physical strength is very important to promote successful ageing .Physical strength does not mean being able to play football at the age of 70,rather it is about maintaining the ability to walk comfortably and safely to perform daily activities independently and without being injured, use stairs comfortably. In such case, physical exercise is most helpful in its ability to cut the rate of certain most prominent diseases of the elderly like coronary heart disease, high blood pressure etc.

Aerobic exercise such as rapid walking, calisthenics, jigging, dancing helps in strengthening the heart muscles and helps the elderly is in better physical shape than sedentary middle aged adults. Weight training is also a very important aspect in physical exercise as it helps the elderly in regaining their muscle strength.

The representation of illness threats and beliefs about the aging self are important sources of motivation for adopting and sustaining

health promoting behaviors. Effective action will depend on the combination of motivation with action plans, multilevel representations of sequence of actions necessary for the adoption and maintenance of healthy actions. The self and social contexts will moderate the motivation generated by representations of health threats and the formation and execution of plans. The individuals confronting a conflicted and unsupportive social environment and lacking a plan for managing that environment are less likely to initiate and sustain health behaviors. The motivation to adopt and sustain good health practices and its success will depend on the individual himself with the support of his family, friends and society.

Social: Social and Physical Security

Social relations contribute to the health and well-being of the elderly and help in shaping successful aging. Social relations help individuals prepare for, cope with, and recover from many of the exigencies of life associated with aging. Social relations describe the broad array of factors and interpersonal interactions that characterize social exchange among people. Social relation includes three concepts *social network, social support, and sense of control*.

Social network refers to the objective characteristics of the persons with whom the individual maintains interpersonal relations. Social network members can be identified in terms of their age, gender, role relationship, years known, residential proximity, frequency of contact, and so on. Social network description reveals critical information about the individuals with whom one interacts but nothing about the nature, content, or quality of those relationships. When we are searching for the content and quality of relationships the concept of social support comes into picture. Social support refers to the actual exchange of support. Social support is an interpersonal transaction which involves aid, affect and affirmation. Aid is instrumental or tangible support (lending money, helping with chores, providing sick care), affect is emotional support and

affirmation is agreement with one's point of view and values. Besides these, factors like the source of support, satisfaction with the support received, and even the perception that the support was provided (whether or not it was provided) are important characteristics of social support exchanges. Sense of control is a type of social cognition which refers to how people think about their own control over the social situations. For proper counseling in reference to social relations, it is important to examine how a particular individual cognitively represent information about people and social situations and then use that information to guide their behavior. How a person processes and represents that information will depend upon the fundamental cognitive processes, memories of the past, perception of self and attributions about others.

The significant others in the life of an individual provide a protective, secure base that allows the individual to learn about and experience the world. The protective base provided by the important persons in one's life leads to better mental health and less psychological distress because it allows the individual to optimally grow and successfully meet the challenges of life. The protective base is both objective and subjective, providing the individual with practical help and more importantly a psychological basis upon which to view the world. Therefore, while preparing the counseling program for the elderly, the participation of the significant others in the environment of the aging individual is also necessary. During the counseling sessions it has to be made clear that the interaction between the individual and the situation changes in response to both the individual's changes and situational changes. The individual should be conceptualized as part of a dynamic network that moves through time, space and the life course surrounding, embraces and supports through the multiple experiences of life. The individual changes, grows, and develops. The elderly persons should be prepared to accept and welcome the changes in his life situation, social environment, family surroundings, and in his/her self in order to lead a more

meaningful and positive life even with advancing age. Under the ideal conditions the understanding of the dynamic aspect of life helps the elderly persons to meet and be responsive to the changes in the overall situation and also allows the significant others in the life of the elder persons to meet and be responsive to the changing needs of the elderly persons.

Social relationships are most beneficial when they instill in the individual a feeling of being valued and competent, of being worthy and capable. Carefully designed intervention and prevention programs can play a very important role in optimizing the ability of older people to successfully meet the challenges of age.

The socio-physical environment provides maintenance, stimulation, and support which can either facilitate or hinder the successful aging process. Beyond social bonding, the strongest tie between elders and the socio-physical environment is to their own home and they feel comfortable, satisfied and secure in their own house. In case it becomes necessary to change the location the elderly person must be advised beforehand and convinced that it is required and will be beneficial, comfortable and secure.

Economic: Financial Security

In the advanced stage of life one needs to be economically sound and should be able to support him/her self financially. Financial security is one of the important contributors in the well being of a person. The social network and social support differ by socio-economic-status (SES). Studies have suggested that the persons belonging to lower SES group have smaller networks consisting of mainly family members. They exchange social support with fewer people and are often less satisfied with the support they receive. Generally speaking social relations are more strained among people at the lower end of the SES continuum and financial constraint is most powerful contributor. At this stage, the elderly people need to be advised how to manage their available finances

effectively and efficiently that they do not have to depend on any one for financial support. Here the next of kin has to play an important role by providing sufficient emotional and psychological support to the elder that they will not suffer on account of low financial resources available to them.

Psychological Characteristics and Aging

The psychology of the individual is basically related to the personality characteristics. It is the personality of the individual, which more or less decides how one will react in a particular situation and what will be the coping mechanism of the person in various given situations. Five key areas of inquiry in this field are - traits and development; well-being, affect and quality of life; stress and coping; goals; projects, and striving; and studies of the self. While considering the development of an individual through different phases and stages of life to advanced age it must be remembered that every individual has his unique personality characteristics which will affect the behavior of the individual. While planning any measures for how to make the aging process a pleasant, comfortable and normal the individuality of the person should not be ignored. Besides outlining general activities, some leverage has to be given for including some specific activities depending on the personality characteristics of the individuals for whom it has been designed.

The main question in this context is – does personality change with growing age, or it is stable? The answer is yes to both the questions – personality in adulthood and later life is characterized by change and stability. Personality is dynamic and evolving through time. The stability of personality can be observed in certain dimensions like neuroticism, extraversion, openness, agreeableness, and conscientiousness. The changes can be seen in self-confidence, cognitive commitment, outgoingness, and dependability. It can be said that the traits of personality are stable and developmental characteristics change.

The positive psychological qualities like life satisfaction, well-being, and morale have a positive effect on the individual and advancing old age is no exception to this. To be psychologically well, one needs to have positive feelings about oneself and one's past life, including the capacity to accept personal limitations (self acceptance). The most universally endorsed aspect of well-being is that one should have quality, caring, trusting, connections to others (positive relationship with others). Being able to manage the demands of daily life and create living contexts suitable to one's needs and capacities (environmental mastery) is another dimension of successful aging. One important feature of well being is the capacity to follow one's own convictions, even if they go against conventional wisdom – this feature leads to self actualization which helps in finding meaning in life, having goals and purpose in life which directs the course of development and keeps one moving meaningfully from one stage to another. The sense of continued development and realization of personal talents and potential through time are some important factors in the psyche of the person which creates a positive attitude in the maturing person. Aspects of well-being like self-acceptance and positive relationship with others do not change much with advancing age but factors like purpose in life and personal growth consistently diminish with advancement in age. The downward trend in these two dimensions is the cause of concern for the well being of elderly persons in later life. The concern of the counselor here should be to help the elderly persons in maintaining these dimensions of personality by inculcating a sense of being important, competent and useful member of the society. Also the society needs to address the needs for purposeful engagement and talent utilization among its growing older population.

Psychological well-being and life satisfaction involve generally cognitive evaluations of self and life. The maintenance of quality of life and well being in the later years of life are largely linked to affect management. Positive self concept leads to high self esteem and helps in maintaining quality of life and feeling of well-being. The

negative perception of self and life causes depression, frustration and low self esteem which creates a hindrance to the feeling of well-being and life satisfaction.

As a counselor it is our duty to help the elderly persons in perceiving themselves in a positive light so that they can lead a meaningful life during later stage of their life. How can we help the person in realizing his/her worth – to deliver lectures in this regard is certainly not going to help. The remedy lies in actively and willingly involving them in various social activities according to their capacity and interest. There is a need to create positive self concept, sense of belongingness, sense of being competent, being useful to their family and community, and sense of being accepted by the significant others in their environment for giving our senior citizens a happy and contented life during advanced age. To achieve this goal everyone needs to join hands – the psychologists, the social worker, the caregiver, the family members, the neighbors and the members of the broader society. Whatever is more important that a preparedness to face old age has to be created before actually growing too old to accept these suggestions and follow the same in order to make one's own life successful and comfortable. The positive psychosocial factors have to be developed as these contribute significantly to disease resistance, faster recovery from illness, and longer survival times.

Elder Abuse and Victimization

Society has an obligation towards the senior citizens to safeguard them against being abused and victimization. Every day we come across the news of the elder being victimized and abused either by unknown or known persons. Moreover, incidents of elder abuse are also symptomatic reflection of relationships and family dynamics going awry. The type of abuse the elders may face can be listed as follows:

1. Physical abuse – Infliction of physical attack of any kind.

2. Sexual abuse – Nonconsensual sexual contact of any kind with elderly person.

3. Emotional or psychological abuse – Infliction of mental anguish, pain or distress.

4.Financial or material exploitation – Illegal or improper use of an elder's funds, property or assets.

5. Abandonment – The desertion of an elderly person by an individual who has otherwise assumed responsibility to look after and provide care to the elderly.

6. Neglect – Refusal or failure to fulfill any part of a person's obligations or duties to an elder.

7. Self neglect – The behaviors of an elderly person that threaten his/her own health and safety excluding the situation where a mentally competent older person makes a conscious and voluntary decision to engage in acts that threaten his/her health and safety.

The category of abusers includes the following:

Family members – Older adult's abuse very frequently occurs in context of the family relations. The studies have indicated that the elderly persons are most likely to be abused by persons with whom they live.

Non- family caregivers – Nurse Aides, the category of staff who have the most direct patient contact and the least formal training, are the most likely category of abusers among non-family caregivers.

Others – The elders certainly need to be protected from swindlers, a person in a position of trust, undue influence, or fraud. Such persons may act alone or work with others to separate an older person from his/her money as well as other resources. Recently telemarketing frauds have emerged as a significant and growing problem. Perpetrators of telemarketing fraud are clever street psychologists who understand and prey on the fears and needs of their targets by

tapping into their victims' emotions.

The self as perpetrator – Two areas of elder abuse involve self destructive behaviors i.e. self neglect and various forms of addictive behaviors. Self neglect is the inability of an adult to perform essential self care activities, including for food and shelter, medical care, and general safety. An extreme form of self neglect reflects marked social withdrawal, domestic squalor, and severe self neglect in the form of resistance to treatment or the accession of the medical care system.

The treatment of elder abuse: To address the problem of elder abuse it is necessary to understand the underlying cause of mistreatment and the consequences of abuse. While considering interventions, different strategies and approaches need to be adopted. The family members and non-family caregivers have to be given counseling and support so that they are able to provide care to the elder person with love and affection, with care and positive attitude towards the receiver. In case of elder abuse with criminal intent there has to be intervention by the criminal justice system. There is also a need for social support, efforts to combat ageism and devaluation of older adults. Moreover, while designing the intervention strategies, the type of elder abuse has to be taken into account because different types of abuse require different methods of intervention.

It is the duty of the caregivers to report the cases of elder abuse to the concerned authorities. Once the case is reported it has to be investigated to verify the adult abuse, and take measures to prevent further abuse and also to punish the guilty. To ensure that reporting is effective, health and mental health professionals and others who are in position to identify the victims of abuse need training on risk factors, what to look for, and how to report identified problems. There is a need to have trained professionals to prevent elder abuse. Secondly, there has to be a group effort and team work towards achieving the goal of protecting our older generation who

are so precious. The team personnel should consist of family members, professional caregivers like physicians, nurses, social workers, judges, police personnel, and bank officers. Thirdly, the older persons themselves have to be trained and educated in order to avoid the cases of abuse of elders. Multidisciplinary teams are beneficial in situations where there is too little or too much agency involvement, the promotions of a family systems approach to case conceptualization and treatment, the introduction of service providers to one another, and the production of a comprehensive care plan.

The Incapacitated Elders and Issue of Guardianship

The increasing incidents of elder abuse and neglect have given rise to the concept of guardianship in United States. In the United States, all adults are considered legally capable of making and carrying out decisions in respect of their personal and financial affairs but there are instances where the adults face loss of capacity. In such cases, a civil court of law specially a Probate Court, after reviewing evidence, appoints a person or agency to act as the decision maker for the person with diminished capacity. The appointed person or agency is known as guardian or conservator depending on the law of the state where the appointment is made. The guardianship or conservatorship can be terminated when the person regains capacity otherwise the arrangement remains till the life time of the old adult.

A wide variety of agencies and individuals serve as guardians. Most guardians are family members and indeed laws of most states reflect a clear preference for family members to be appointed as guardians. When family members are not available, when there is allegations of elder abuse by the family members, family members are incapable other people like neighbors, friends, and long time professional associates (accountants or attorneys) may request the court for appointment as guardian. An agency or private professional guardian may petition the court for appointment.

Summary

In a nutshell we can say that aging is inevitable. Each one of us has to grow old and travel towards advanced age. It is the duty of the family members, society and community, Government and Non-government Agencies, Criminal Justice System, other professional service providers and other agencies to make the old age a pleasant experience, a comfortable life. Our senior citizens require some healthcare, affection, humanly treatment, respect, mental, physical, and financial and social security, and a sense of satisfaction with their life conditions. To achieve this goal we need to have a positive attitude towards our elders to make their life happy and meaningful at the end of their journey of life. We need to train ourselves how to achieve this goal. Our focus should be to train and counsel ourselves and not others.

Another factor which needs emphasis is that we require to prepare each and every growing member of the society beforehand in order to have less number of incapacitated and disoriented adult members in the society. The best method of counseling the elders is to support them in such a way that they are able to help themselves. Effort must be directed towards making our elders self sufficient.

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DEMENTIA IN ELDERLY: AN AYURVEDIC PERSPECTIVE

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ABSTRACT

Dementia is deterioration of intellectual functions of brain as a result of organic disease. It is a neuro- degenerative disease characterized by cognitive dysfunction, such as orientation, memory, learning, and calculation. Most common presentation is slowly progressive forgetfulness of recent events. According to Alzheimer Related Society of India (ARDSI), for the year 2010, an estimated 3.7 million Indian people aged over 60 have dementia of which 2.1 million are women and 1.5 million are men. The prevalence of dementia increased steadily with age and higher prevalence was seen among older women than men. However, in Ayurveda, it may be correlated with *Buddhi-Smriti Hrasa.* There are three aspects of mental ability i.e. *Dhi* (process of acquisition / learning), *Dhriti* (process of retention), *Smriti* (process of recall). Any disturbances in this aspect resulted in loss of mental ability. Diagnosis of dementia of an individual is associated with proper neuropsychological assessment and evaluation. Management of dementia requires a multi-disciplinary approach. Authorities of Ayurveda have noted some preventive strategies for dementia, such as *Sirasneha, Medhya rasayana, Brinhana nasya , Yapana vasti, Satvavajaya , Svarna & Rajatha kalpas (gold and silver nanoparticles), Achara rasayana(rejuvenating conducts), Hitopadesh, Yoga , Satvika ahara, Naishthiki chikitsa.* Finally the study reveals that with increasing life expectancy dementia and other age related neurodegenerative diseases become a global concern. Ayurveda may offer some preventive measures to combat with this devastating disease.

KEY WORDS: Elderly, Dementia, Buddhi, Smriti, Medhya Rasayana, Satvavajaya

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INTRODUCTION

"....from delusion comes loss of memory; from loss of memory; the ruin of discrimination; and on the ruin of discrimination, the individual perishes".

(Source : Bhagavad Gita; Samkhya Yoga; Chapter 2, Sl 62)

The concept of memory loss and death due to this loss was first described in the *Bhagavad Gita*. In ancient India, four thousand years ago, Mahabharata (the longest epic in the world) stated that, 'there are two classes of diseases – bodily and mental. Each arises from the other, and neither can exist without the other. The mental disorders arise from physical ones'. In the Indian context the conception of neurodegenerative diseases like dementia could be traced back to the Vedic age and more specifically the medical corpus known as the *Atharba Veda*. In Indian medical texts written between (100 BC to 1600 A.D.) where Caraka, Susruta, Vagbhatta, Madhava Kar, Sarangadhar and Bhavaprakash had been remarkable for their contributions related to etiopathogenesis, diagnosis, prognosis, prevention in different Ayurvedic medicines including surgery. They gave different principles of neuroprotective treatment to deal with these diseases (Deb, 1987). However no specific term or name was ascribed to this concept.

Now come to the context of the elderly. Why the term 'elderly' is very much associated with dementia. The older generation is increasing steadily all over the world. People today are living longer and generally healthier lives. This represents the triumph of public health, medical advancement, and economic development over disease and injury, which have constrained human life expectancy for thousands of years. As life expectancy has increased, there is longer exposure to extrinsic and intrinsic insults. According to World Population Report 2006, almost 500 million people worldwide were 65 years and more than that. By 2030, the total number is projected to increase to 1 billion - 1 in every 8 of the earth's inhabitants. Significantly, the most rapid increase in the range of 65 and older population are occurring in developing countries, which will see a

jump of 140 percent by 2030 (World Population Report, 2010). India is the home for more than 80 million people older than sixty years recorded in the year 2011. This age group, which was 8% of the population, is expected to grow dramatically in the coming decades (Census, 2011). Demographically all over the world there are 1 Billion people who are battling with neurodegenerative problems. Of these people, approximately 7.5 percent belong to the 60+ age group. In the Indian context the aged population now stands approximately 80 million and the preponderance of neurodegenerative ailments is 5.6 percent (WHO, 2010).

According to Alzheimer's Related Disorder Society of India (ARDSI), in the year 2010, an estimated 3.7 million Indian people aged over 60 have dementia of which 2.1 million were women and 1.5 million were men. The prevalence of dementia increased steadily with age and higher prevalence was seen among older women than men. The larger proportion of older women than men who have dementia may be due to the fact that women live longer in India. However, studies of age-specific incidence of dementia among older people show no significant difference for women and men. It may therefore, appear that gender is not a risk factor for Alzheimer Disease or other dementia among older people. The persons with dementia in younger age groups, 60-75 years, are expected to increase steadily over time; and a steep increment amongst age groups over 75 years can be predicted after 2030. In India the number of people with Alzheimer's disease and other dementias is increasing every year because of the steady growth in the older population and stable increment in life expectancy. Thus, an estimated twofold increase by 2030 and threefold by 2050 can be expected. By the year 2025 United Kingdom is projected to have 1 million people with dementia (Dementia UK Report, 2007). According to current estimates, India has more than 3 million people with dementia (PwD) and is expected to overtake USA in number of PwD by 2015 (ARDSI, 2010). So it is evident from the aforementioned discussion that major victims of this disease are our parental generation all over the world.

We now recognize this concept as Dementia and Dementia due to Alzheimer's disease is one of several age associated neurodegenerative diseases characterized by loss of memory. Memory is a complex function of the brain that has fascinated philosophers and scientists for centuries. It is the ability to store what is learned or experienced, and can be recalled in need (Singha Mahapatra, 2007). Good memory is an asset of a person, a poor memory is handicap, and loss of memory is living dead. Healthy mental ageing may be defined as the absence of the common disability mental health problems of elderly, especially cognitive decline and depression (Michael and William, 2002). Modifiable diet and life style along with regular practice of meditation (yoga) have been shown to be associated with healthy mental ageing. Depression and Cognitive impairment are among the most common neuropsychiatric disorders in the elderly (Sadock, Sadock and Ruiz). According to Ayurveda, *Sira* (Brain) is the main seat of *Manas, pranas, and Indriyas (Agnivesh,2010)* . One hundred seven *Marmas* (vital points) are identified in the body out of which three viz., Head, Heart, and Kidney are very important and they are known as T*rimarma or Mahamarma*. In Chraka Samhita, there is some guide lines to protect these three *Mahamarmas (Agnivesh, 2012)*. So, the brain is the seat of all sense organs, organs of actions, vital areas, motor and sensory areas hence it is also called *Uttamaanga* - prestigious part of the body. An increased life expectancy both in developed and developing countries has been accompanied by an increased number of people suffering from senile dementia. Elderly dementia is not described in Ayurvedic classics but the clinical features of senile dementia can be correlated with *Buddhi – smriti – bhransha* which has been mentioned by Charaka. Buddhi may be described as the knowledge, produced by successive interaction between the *atma, Manas, indriyas and Indriyarthas*. In Charaka Samhita the word *prajna* has been used which is synonymous to *buddhi (Agnivesh,2010)* .

Objectives

The present paper makes an attempt to understand (i) Ayurvedic perspective of dementia, (ii) pathogenesis of Dementia in terms of Ayurvedic concepts and finally (iii) suggests the management strategies from Ayurvedic perspectives which can be utilized for this devastating geriatric disorder.

Method of Study

Data and information have been collected both from primary and secondary sources available at different institutions at Kolkata and also from outside India (London, Oxford, UK). Different medical journals published during the early nineteenth century and first half of the twentieth century has been consulted. Online journals available through JSTOR, SAGE, OXFORD, TAYLOR & FRANCIS, CAMBRIDGE ONLINE were of great help for the

Dementia according to Medical Science

Dementia can be described as a group of usually progressive neurodegenerative brain disorders (which occurs in Alzheimer's disease, in cerebro-vascular disease, and in other conditions primarily or secondarily affecting the brain) characterised by intellectual deterioration and more or less gradual erosion of mental function followed by physical function, leading to disability and death. So, dementia is a state of mental deterioration characterized by falling memory and loss of intellectual and cognitive functions (Harold,1983).

Dementia is a typical geriatric disorder that occurs due to degenerative changes in central nervous system (CNS) for various reasons. The core feature of dementia is the deficits in memory function, primarily the recent memory. Besides, patients should have at least one of the followings: (i) apraxia (an acquired disorder of learned, sequential motor movements that cannot be

accounted for by elementary disturbances of strength, coordination, sensation, or lack of comprehension or attention), (ii) agnosia (failure to recognize familiar objects), (iii) aphasia (deficits in language function), and (iv) disturbances in executive function. There should be evidences of deterioration in social and occupational functioning (Biswas and Das, 2009).

Causes of Dementia

Dementia may be of two types both reversible and irreversible. In both case the causes are as follows.

Reversible: D = drugs, delirium, E = Emotions and Endocrine disorders, M = Metabolic disturbances, E = Eye and Ear impairments, N = Nutritional disorders, T = Tumours, Toxicity, Trauma to the head, I = Infections disorders, A = Alcohol, Atherosclerosis.

irreversible: Alzheimer's, Lewy Body Dementia, Picks disease (Fronto – Parietal dementia), Parkinson's disease, Head injury, Huntington's disease.

Most common presentation is slowly progressive forgetfulness of recent events. Other common presentations are difficulty with managing money, driving, shopping, following instructions, finding words, naming difficulties, or getting lost in familiar places. Common symptoms of dementia are of two types – (a) Psychological symptoms like Memory loss, including not recognizing friends and family members, difficulties in concentrating, difficulties in comprehending words, completing sentences, finding the right words , loss of familiarity with surroundings, wandering aimlessly (b) Physical symptoms like impaired movement or coordination, muscle rigidity, shuffling or dragging feet while walking , insomnia or disturbances in sleep patterns , weight loss ,incontinence , muscle twitching or seizures .

Diagnostic Approach and Principles of Treatment

A careful physical and neurologic examination is indicated in all cases. History and physical examination, special emphasis should be given to both the patient and the patient's family. Mental status examination that is, evaluation of mental status is mandatory. This includes orientation, memory, general information e.g. names of major cities, states, rivers, etc.; calculation, perceiving abstraction, naming e.g., asking the patient about objects like pencil, book, knife, table , coin ,etc. Depending on the circumstances and clinical information , some or all of the investigations should be performed , such as CBC (Complete Blood Count), Urinalysis, Bio-chemical screening including liver function tests , Serum vitamin B_{12} level, Serum electrolytes ,Arterial blood gases, Thyroid function tests (Free T_4 and TSH) , Tests for syphilis AIDs , Chest films , skull films , Electroencephalogram, Lumber puncture , CT / MRI to exclude structural deformity , SPECT (Single Photon Emission Cardiac Tomography) , and PET (Positron Emission Tomography) (Biswas and Das,2009).

In reversible dementia, first aim is to identify the cause and treat accordingly. But in irreversible dementia no remedy is available and the goal of treatment is to arrest the progress of the disease and manage manifestation. Care giving experiences needed for long term care and end of life care. Preventive care comprises of low fat, and low calorie diet, intake of omega – three fatty acids, antioxidants, maintaining normal BP and Pp sugar. Keeping ones' self mentally and socially active may help to slow down the progression.

Dementia in Ayurveda

The Ayurvedic System of Medicine stresses the balance of three elemental energies or humors or *Tridoshas* namely: *Vāyu* (air and space – "wind") – the movement principle, *pitta* (fire and water – "bile") – transformation principle and *kapha* (water and earth – "phlegm") – principle related to strength and stamina. A disturbance

in this balance results in disease with its attendant ailments. Neurological disorders are classified under humor -*Vata rogas* (diseases) in Ayurveda. *Vata* is the energy that moves throughout the body, including brain and thus controls both voluntary and involuntary functions. The pathogenesis of neurological disorders is due to deranged humor - *Vata* which enters the tissues (dhatu) such as muscles (Mans), ligaments (Snayu), etc. The exacerbation or deficiency of this energy (vata) can cause disturbance in the form of hyperactivity or weakness of the nervous system. Within Ayurvedic texts, over eighty *vataja* disorders are described, including *Apasmara/Apasmrti* (Epilepsy), *Kampavata* (Parkinson's Disease) and *Shiroruk* (Headache), Foot Drop (*Paada Bhramsa*), Numbness in Feet (*Paada Suptata*), Sciatica (*Gridhrasi*), Loss of movement in thighs (*Urusthambha*) and Lameness (*Pangu*) Paraplegia, Wasting of arms, Brachial plexopathy (*Baahu soshana*), Tinnitus (*Asabdasravanam*), Temporal Headache (*Shankha Bheda*), Frontal Headache (*Lalata Bhedascha*), Bell's Palsy (*Arditam*), Monoplegia (*Ekanga roga or vata*), Quadreplegia/Poly neuritis (*Sarvangavata*), Hemiplegia (*Pakshavadha*), Convulsions (*Akshepaka vata*), Syncope or Blackouts (*Tamaha*), Giddiness or Vertigo (*Bhrama*), Tremors (*Vepathu*), Hiccoughs (*Hikka*), Delirium (*Atipralapa*), Insomnia (*Anidra*), Instability of Mind (*Anavasthita Chittam*), Tetanus (*Hanugrah*) and Lathyrism (*Kalay Khanj*). For each category, a detailed clinical profile is presented and medical treatments are proposed.

The term 'elderly dementia' is not available in the Ayurvedic texts but clinical features of dementia can be correlated with *Buddhi – Smriti Bharansha* (Buddhi = cognition, *Smriti* = memory, and *Bhransha* = decline). The main function of *Buddhi* is to identify or differentiate good or bad (*Hita or Ahita*) which is essential for healthy and successful life. Another name of *Buddhi* is *Medha or Prajna (Triguna,2000)*. The prajna has three components i,e, *Dhi* or Buddhi or intelligence; *Dhriti* or power of retention of known information , and *Smriti* or memory, the ability to retain and recall

past experiences. Ayurveda has considered the physical and mental diseases as two separate specialized subjects. However, no line of demarcation has been drawn between the mental and psychological diseases and a flexible psychosomatic approach has been worked out. However, Ayurveda has been reputed for its Philosophical bases of the psychological diseases and their treatment. Much of the original literature in Ayurveda being mutilated, we hardly find any systematic account of its contribution to the subject of mental health and psychopathology. According to Ayurveda, the psychic functions and illnesses are related with *Sira* and *Hrdaya.* The *Sirasa* has been considered as an organ which regulates the senses. When it is injured, psychoses and other psychiatric illnesses are produced. *Shirohrdaya* is an important organ for controlling the higher psychic functions such as intelligence and emotional activities. It has an important place in the psychopathology of psychiatric illnesses. In this context *hrdaya* may not be considered as the anatomical entity of the heart. It represents the functional entity of the brain. However, the following section is a brief account of the Ayurvedic concept of *siro* and *hrdaya* in this direction.

Concept of śira

Charaka has divided the whole body into six regions – two upper limbs (*Dvau Bahu*), two lower limbs (*Dvau Sakthini*), head- neck (*Sirogrivam*), and trunk(*Antaradh*i) (Agnivesh,2010). Susruta, the great ancient anatomist and father of rhinoplastic surgery has also divided the body into six parts. They are – four limbs (*sakha chatustay*), trunk (*Madhyam*), and head *(Sira*) (Susruta,2012). Charaka clearly pointed out, the *sira* is known as the best of all organs, where the vital breath and all the special sense are located. It is also the *Buddhinibas, Smritinibas, Gyannibas, Tapanibas* (seat of intelligence, memory, knowledge, meditation and concentration) (Sharma, 2012). The vital breath (prana) of man resides in *Shira, Hridaya, and vasti*, hence one should make every effort to protect them from external and internal trauma, to follow the code of

conduct or rules of personal health, seasonal regimen, and positive life style for maintenance of health and prevention of diseases along with rational therapy in disease associated with these organs (Agnivesh, 2010). According to Vagbhata, *Vasti* and *Sirah* are important organs of the body.

Hṛdaya the seat of Manas (Mind)

The term hrdaya (hr= to take, da = to give and ya = to move) is an important subject in Ayurveda. This term has several meanings like *Urohrdaya* (Heart), *Shirohrdaya* (Brain*), Nabhihrdaya* (Umbilicus) , *Matrihrdaya* (Placenta), *Talahrdaya* (palm and sole). According to Charaka mind is dependent on hrdaya. He regards that hrdaya is also the root of manavaha srota (psychic pathways). Charaka also mentioned that ten great Dhamanies , *manas* (psychic), *buddhi* (intellect), *cetana* (consciousness) and *mahabhutas* (protoelements) are attached to *hrdaya* .Sushruta also pointed out that *hrdaya* is the seat of mind . Vagbhata has also the same opinion on this topic. Kasyapa has also indicated that all *indriyas* and *manasa* derived from hrdaya. Vedanta Philosophy has also mentioned that manas (mind) is situated in the heart (Hrid padma). According to Patanjali Yoga Philosophy the heart is regarded as the seat of *citta* (mind).

Besides, the concept of *Siro and hrdaya* ,concept of neuro-psychiatry are vast but scattered in the Ayurvedic texts in terms of *Mana, Manasik dosha, Manas prakriti , Manasik roga* such as *Unmada* (Psychosis and neurosis), *Apasmara* (Epilepsy), and *Atatva abhinivas* (Delusion) ,*Graha Roga* (Neuropsychiatric disorders probably caused by super natural power), *Bhutavidaya* (study of Gods, Devils, and demons), important *Vataja Rogas* like *Vaksanga* (dysarthria), *Mukatvam* (aphasia), *Anavasthita cittam* (unstable mentality). Description of *Sattvasara* person (a person with a good mental threshold) and concepts of *Monovaha srota, Cetanavah srota, Sanjna vaha srota* and its origin also mentioned in Ayurvedic texts .

Concept of Manasa (mind)

The concept of mind (*manasa*) has occupied supreme position in Ayurveda,hence its approach is psychosomatic or mind body related. Mind is nothing but bundle of thoughts and is the superior organ which is associated with perception, thinking, and analysis of worldly objects.(*Man bodhe, man jnane, mananat manaha* – Amarkosa). All the precise and minute functions of the body are controlled by manas in the living body. Mind is considered as doer, knower, and enjoyer. It is *Atindriya* (super- sensory*), Antarindriya* (observed from inside), and *Ubhaya indriya* (controls both sensory and motor functions of the body). The knowledge is only possible when soul comes in contact with mind, sensory organs, and sense objects. Thinking (cintya) is the main object of mind (Manasastu cintayam arthaha- Ca.su.8/16). The chief functions of manas are assimilation and discrimination .The strength of *Indriyas* (sensory and motor organs) are derived from manas . According to Susruta, *manas* is both the organ of perception and action. *Indriyas* performs two types of functions (1) perception and (2) actions. Eye, ear, nose, tongue, skin are the five organs of perception and form, sound, smell, taste, and touch are their objects respectively. We require knowledge of all the objects by these organs of perception. Organs of physical activity are five in number they are *Hasta* (holding / grip , instruments for blind), *Padas* (movement), *Payu* (excretions), *Vak* (speech), and *Upastha* (Pleasure) (Shukla,1978). With the help of the above motor organs a man performs all the functions. Therefore, Manas is the regulator of all the organs of actions. According to Charaka , *chinta* (thinking), *vicara* (reasoning), *uha* (analysis), *dheya* (attention), *samkalpa* (determination) and such other functions are related with mind but its main functions are *uha* (analysis) and *vicara* (judgement). Susruta also mentions that *kama* (lust), *soka* (grief), *bhaya* (fear), *harsa* (happiness), *visad* (depression) are the objects of mind . So, significant objects of the manas are thought, judgement, argument, meditation and determination, happiness, sorrow, desire, attention,

memory, sleep, apprehension, intellect, dream, doubt and talent. The above mentioned objects clearly indicate the important functions of the manas. As per modern psychology, mind is the aggregate of thinking, judgement, and conclusion. *Rajas and Tamas* are two *manasik dosas* and are involved in mental disorders. *Rajas* is related with vata dosha where as *Tamas* is associated with Kapha dosha . All the activities are due to *Raja*. It leads to a life of enjoyment and restless efforts and *Tamas* is responsible for inertia.

Manas Prakriti (mental temperament)

Prakriti is the swabhava or nature of an individual. It is the total some of physical, physiological, psychological, and immunological aspects of life by which one can separated from the other. This concept of individuality or biological variation is one of the strengths in Ayurveda. The human mental temperament has been divided into three major groups i.e. *sattvic* (superior quality of mental temperament), *Rajas* (middle quality of mental temperament), and *Tamas* (inferior quality of mental temperament). Sattvik mind possesses intelligence with good memory, believes in action without action of result , universal welfare, kind hearted, truthful, share food material with others . A person with rajasik temperament is unstable, egoist, liar and cruel. Such persons are desirous of honour by the society. They are also angry. A person with Tamas temperament is characterised by non – believer of God, foolish, inactive, totally devoid of intellect, lazy, and fond of sleeping.

Sattvasara (Person with a good mental threshold)

It means the man whose mental threshold is of high quality. He is enriched with good memory, and intellectual functions. He is religious, grateful, brave, and courageous, understands the subject easily, and performs the actions with full competence. He is a man of organised thought. The sattvasara purusa is multidimensional in nature, and is serious and stable even in crisis . *Sattvasara* prariksha has a great significance in Ayurvedic

Diagnosis specially to determine mental health status of an individual in health and disease. A sattasvara person can better tolerate psychological stress and are therefore less prone to develop stress related ailments. So, sattvasara principally speaks the psychological fitness of an individual. To determine sattasara, assessment of *smriti* (memory), *bhakti* (faithfulness , reliability), *prangya* (intelligency), *sourjya* (courage), *soucha* (clean manner), *kalyanaabhinibesh*a (welfare for masses) of an individual should be done (Shah,2002).

Manovaha Srotas

*Manavaha srota*s refers to the channels or structures through which manasa (mind) and samjana (sensations) are transported. It has been described under two headings i.e. (i). Manavaha srotas : medical psychiatry , and (ii). Vata nadi tantra : Nervous system. Manavaha srotas , also called *cetanavah* and *sanjanvaha* srotas originates from hrdaya and provide consciousness of the individual . *Viruddha, and Asuci Ahara* (incompatible and impure food and drink), *manasik abhighat* (mental trauma like death of closed relative, social isolation), *viharaja hetu* (not holding of mental urges), *Bhutabhisanga* (infection and infestations), *Visa sevan* (exposure to different types of poisons and toxins like arsenic, ganga, bhang , heroin), *saririk vyadhi* , *Vriddhavastha* (old age) etc. are the causal factors of *Manovaha srotadusti* . Disorders of personality, perception, behaviour, emotions, thought, memory and altered state of consciousness are the clinical manifestations *of Manovaha srota dusti* . Disorders related to Manovaha srotas includes *Unmada* (insanity), *Apasmara* (epilepsy), Atatvabhinivesa (delusion), Avasada (depression) , Buddhi smriti Hrasa (dementia), *Mada* (intoxication), *Moorcha* (syncope) and *Sanyas* (cerebro vascular accident) are described in Ayurvedic texts . The disorders like *mada, moorcha, and sanyas* are described in Vidhishonitiya chapter which indicates that these disorders are the outcome of derangement in the blood vascular system or blood related

disorders (Agnivesh,2010). According to *Yogasutra of Patanjali* there are five states of mind, i.e. *mudha, Ksipta, viksipta, ekagra , and niruddha.* The rajas and tamas gunas are prevalent in first two states of mind, third one is the state of equilibrium. The last two states have prevalence of sattva guna and do not produce any disease. The various psychiatric illnesses originate in *mudha and ksipta* states of mind (Singh, 2003).

Jarajanya Buddhi- Smriti- Bhransha

It is a clinical condition of last part of life characterised by impairment of *Dhi* (understanding), *Dhriti* (will), *Smriti* (memory), *Manasa* (mind) due to involvement of Manasik dosha (Raja, Tama) , and Sharirik dosha (Vata, pitta and Kapha).The main function of Buddhi is to identify or differentiate *hita* (good), from *Ahita* (bad), which is essential for healthy and Successful life, *Prajna* is the synonym of buddhi. Different types of mental health problems in old age are mentioned in the Ayurvedic texts. These are - *Chittavasada* (depression), *Smriti-Buddhi- Hrasa* (dementia), V*atik unmade* (schizophrenia), *Atatvabinivesa* (delusional disorder), *Chittodvega* (anxiety disorder), *Manas Prakriti Vikara* (Personality disorder), *Nidra vikara* (insomnia), *Madataya* (Alcohol / drug abuse).

Aetiology and Pathogenesis of Jarajanya Buddhi- Smriti- Bhramsha

i) *Aharaja* (tamasic, rajasic, and dusta ahara), (ii). *Viharaja* (unwanted,uncontrolled, and antisocial activities), (iii). *Rogaja* (vata dominant disorders, psychosomatic disorders), (iv) *Manasik karan janya* (grief, phobia, anger, mental trauma, abnormal sexual behaviour, family and social problems), (v) *Purvakrta papa karma* .

Constant dwelling on sense objects leads to desire. When desire is left unfulfilled, one becomes overcome by anger leading to infatuation resulting in confusion and impairment in memory. Once memory is impaired, there is loss of intellect or reasoning which

leads to complete ruin. This concept of impairment of memory is mentioned in Gita. Stability and concentration of *Mana* is dependent upon the normal conditions of *Vyana vayu* .Thus, the factors which provocate the *Vata*, especially the Prana, Udana and Vyana are also the causative factors of *Smritibhramsha*. Derangement in the function of *Shukra* and *Ojas* may lead to Smritibhramsha. In a nut shell the vitiated *Prana, Udana and Vyana, Sadhakapitta, Avalambaka and Tarpakakapha* and *Rajas and Tamo Doshas* are regarded as the factors involved in the pathogenesis of *Smritibhramsha* and all the symptoms are produced due to these factors. Loss of memory is the main event in dementia. The classics of Ayurveda have noted decrease in *Grahana* (cognitive function), *Dharana* (retention), *Smarana* (memory) *Vachana* (power of expression) and *Vijnana* (capacity for learning and analysis of facts), *Daurbalya* (impaired work ability).The symptom of *Smritbhramsha* may comprise both somatic and psychological symptoms.

The symptoms of *Smritibhramsha* are related to mind also. They are *Krodha, Udvega, Moha, Chinta, Bhaya etc*. Some psychological symptoms like *Asahishnuta* (irritability), *Vishada* (depression), *Bhaya* (phobhia) etc. will manifested . When the disease runs for a chronic course, the above symptoms may get clustered together and other physical and mental disorders may manifest (Nambudri). Chikitsa sutra (principle of treatment) of Charaka explains three types of therapies of any physical and mental disorders namely - *Daivavyapasraya* – (Daiva refers to god and invisible and vyapashrya means specially dependent upon) Spiritual therapy or divine treatment based on faith , *Yuktivyapasrya* – (yukti means reasoning i.e. treatment based on reasoning which is practised now a days and *Sattvavajaya* – (*sattva* means mind and *avajaya* means to control) Mind control therapy or therapy which enhance satva guna in the body (Agnivesh,2008).

Management Strategies

Medhya Rasayana (Rejuvenating the brain)

There are specific drugs that act on the brain and improve intellectual functions of the brain. Such drugs are used to promote mental health in healthy and diseased condition. Commonly used drugs are C*entella asiatica,* Ashwagandha (Withania somnifera), *Brahmi* (Bacopa monnieri Linn.), Sankhapushpi (Convolvulus pluricaulis). Some Svarna and Rajatha Klapas like Manasmitra vatakam , Smritisagar rasa are also helpful in senile dementia. These drugs enhance the function of *Buddhi*, decreases the *Raja* and *Tama* Dosas and provides better functions to *Manasa and Buddhi*. Thus, the Medhyarasayana drugs such as Ashwagandha, Brahmi, Mandukaparni, Sankhapuspi, and several other herbal and herbo-mineral drugs are very useful in the management of dementia and other neurodegenerative disorders.

Murdha Tailam (Head oiling)

Head is the most superior part of the body (*uttamanga*) . So, oileation of head has been separately described under the heading of *Mrudha Tailam* . Four methods of oileation of head namely (a) *Shirabhyanga* (rubbing of oil on scalp hair and head), (b) *Shirodhara* (pouring of oil on forehead and scalp, (c). *Shiro pichu* (Medicated Oil swab kept on frontal lobe), and (d). *Shiro vasti* (immersion of head) . Gradually they are more effective for giving strength to the head (Sharangadhar, 1400 A.D.).

Brumhanam Nasyam (administration of medicated ghee or oil through nose)

The Nasya is considered as the best and most specific procedure for the treatment of diseases of head. The nasal passage is considered as the portal of head and *veeryam* of the drugs introduced through the nostril which spread throughout the head and eliminates the doshas .The *veerya* of nasya oushadha reaches *sringataka Marma*, which is considered to be the meeting place of srotas of *Nasa* (nose),

Karna (Ear), *Vaktra (*Oral cavity), *Netra*(Eye) . From the head the veeryas of the medicine spreads all over the head and eliminating the doshas from the *urdhwanga* . It is important both in *swastha* as well as *Aturas.* In swastha (healthy) to prevent accumulation of doshas, keep srotas clean and promote the strength. The strength of indriyas , and avayas . It may be beneficial in manasika rogas like Chittavasada (depression), Vatic unmada (psychosis) , and Buddhi smriti bhransha (Alzheimer's disease) . For this purpose *Ksheerabala taila* and *Anu taila* are much effective.

Satvavajaya (Psychotherapy)

This therapy enhances sattva guna of the individual. This type of treatment corrects the deranged understanding, will and memory of a mentally ill individual. Vagbhata also regards that best therapy for psychiatric illnesses is true understanding (*dhi*), control of mind or will (*dhriti*), memory (*smriti*) and spiritual knowledge. It is the counselling of the family member and care giver also.

Achara Rasayana (Achara = good conduct, Rasayana = rejuvenation)

Ayurveda considered good conduct by means of rejuvenating body, mind, and socialization. It is one of the keys of longevity and rejuvenation of the brain. Mental tension augments ageing and achara rasayana reduces mental tension which slow down the aging process.

Sattvika Ahara

The nutrients of body are also the nutrient of mind, sense organs and intellect. In Chandogyopanisad it is mentioned that end product of digested food is divided into three parts. The stool is formed by the sthula part, muscle tissue is formed by madhya part and the mind get its nutrition from the minute part. Sattvik diet is always light, nourishing and tasty, freshly cooked. This type of diet increases the energy of the mind and produces cheerfulness, serenity and mental clarity. Milk, butter, ghee, almonds, dates,

moong (green gram), sprouts, barley, wheat, cereals, fresh vegetables and seasonal fruits along with some spices like turmeric, ginger, Cinnamon, coriander, fennel, and cardamom come under sattvik food.

Yoga, Meditation and Prayer

Yoga is essentially a part of Ayurveda. The central theme of Patanjali's yoga sutra is the withdrawal of mind from its scattered eternity to focus upward like wealth beauty, position, and fame. Yoga is best anti ageing and directly rejuvenating the hypothalamus, pituitary, pineal and others endocrine glands. Meditation counter act the loneliness of the elderly and slow *Buddhi-smriti hrasa* .In the Western world , meditation means a concentrated state of mind, but according to the eastern philosophy meditation is fixing mind in a spiritual ideal . It balances secretions of the endocrine glands. So benefits of yoga are simple i.e. less stress, more energy, confidence which helps to improve the skin and the nervous system. It is a total integration of the physical, mental, intellectual, and spiritual aspects of the human personality.

Mantra Rasayana

Mantra is nothing but repetition of words which stimulates cortical activity of the brain and thus helps in improvement of memory. Chanting of *mantras* particularly the *Gyatri mantra* acts as a good *rasayana* for mind especially in the terminal stage of any malignancy. The aim of this therapy is to increase the physical and mental strength in aged.

Ideal physician

In the management of any disease the physician plays a great role . Every Physician has two roles to perform: role as a physician and role as a man. To be an ideal physician his knowledge, skill, experience, expertise, ability to treat and cure patients with confidence, sympathy and compassion are important but to

become an ideal man is extremely difficult. The aim of every physician should be to become an ideal man, i.e. an enlightened man and an ideal physician, i.e. an enlightened physician.

Instrumental and Vocal Music

Both are very soothing especially devotional songs like Bhajana are very beneficial in dementia. These are also very soothing to the brain.

Conclusion

Ayurveda is basically a health science and not like modern medicine that deals with diagnosis and treatment. Modern medicine is technically advance and a progressive system, because of intensive worldwide research. It has taken the help from other basic sciences like chemistry, biophysics and pharmaceutical chemistry for its advancement. But Ayurveda is well known for its role in the management of chronic, incurable, degenerative and iatrogenic diseases. The structural units (Dhatus) of the human body and their metabolic impairment (Dhatagni manda) along with distortion of body channels (Srotansi) are the primary causes of degeneration including neurodege-neration (like dementia) as per Ayurvedic findings. *Vayu* is responsible for all types of neuromuscular activities and mind (*Sangatmok, Chestatmok and Manas karmo*). So disturbance of *Vata dosha* may leads to disease, degeneration and death. *Srotosodhan* (Purification of body channels), Tarpano and Rasayana (nourishment of neuro nutrients) and Prakitisthapana are the principles of treatment of Vata vadhi, i.e. specific disorders due to *Vata dosha*. This principle of treatment may be applicable to neurodegenerative problems. Ayurveda throws some light on this type of problem with the help of Panchakarma therapy. Rasayana, in the form of diet, medicaments and positive life style along with some intellectual promoting medicinal plants (Medhya Rasayana) like *Asparags resimosus, Bacopa monniera and Centella asiatica, Mucuna pruins etc.* delay

the brain ageing.

Senile dementia is a neurodegenerative condition characterised by global cognitive dysfunction such as orientation, memory, learning, and calculation. In Ayurveda, the clinical features of it is very much nearer to *Buddhi-smriti-hrasa* . Most common presentation is slowly progressive forgetfulness of recent events .As per Western thought dementia are of two types - reversible and irreversible. Management of reversible type is to identify the cause and treat accordingly but in case of irreversible condition no cure is available. Ayurvedic texts has mentioned a comprehensive package of therapy comprises of head oiling, brain rejuvenation, nourishing oil through nose, yoga, meditation, and prayer , vegetable diet , seasonal fruits ,and some rejuvenating conduct for prevention of dementia. Lastly it can be said that Ayurvedic preventions and therapeutic techniques for the management of neurodegenerative diseases like dementia are very effective if used properly. It can delay irreversible senile dementia which is still a grey area in conventional medicine.

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