INTRODUCTION:

Ageing is a complex multifactorial and inevitable process. The proportion of elderly people is continually increasing, and therefore, the number of individuals with one or another age related disease is also increasing. These age related disabilities could be delayed or treated to make the elderly healthier and happier. About 50% of individuals over 65 have some physical disability. Thus age related physiological deterioration and diseases are of increasing concern to physicians because of “Old age boom” anticipated in the 21st century.

Ageing is a biological phenomenon; life span of a particular species depends upon many factors including environmental and genetic influences. Human have the largest life span and consume more energy on a per kilogram weight basis. Till date there is paucity of the research and large gaps exist in our understanding of human ageing process and why human live much longer, ensure a healthy productive life, it will provide new concepts for the development of treatment of the large number of diseases seen in the elderly.

HYPOTHESIS OF AGEING:-

1. Wear and tear Hypothesis of ageing:- A common concept is that oxyradicals destroy cells and/or enzymes leading to lack of adequate cells/enzymes to maintain optimum health. However, there is lack of adequate data to support this theory of ageing. Infact, a tissue form older animals appears to have lost very little cells, and variability of the cells in older individuals appears to be quite normal.

2. Disdifferentiation hypothesis of Ageing:- Explains that oxyradical could react with genetic apparatus of cells leading to production of different and inefficient cells.

3. Longevity Determinant Genes:- Research work by cutler revolutionized the understanding of biogerontological process of ageing. It is usually thought that life span is governed largely by the biological status of the organism and it is believed that mechanism of ageing is multifactorial and complex. There are many determinants, which increase and decreases the ageing of the organism. Thus, it is time to test further longevity determinant gene hypothesis.

4. Free radicals mechanism of tissue injury:- Free radicals are molecules or fractions of the molecule having unpaired electron in their outer most orbit. Available evidence suggest that there is strong correlation between the oxyradical concentration is various tissues/organs and life span energy and
maximum life span potential in years. By reduction

5. Free radicals of oxygen

By reduction

Oxygen atom

Molecular Oxygen (e^2 unpairable)

Superoxide radical

Hydrogen peroxide

Hydroxylion (OH) → H₂O

(Sequential reduction of molecular oxygen)

Concept of Ageing in Ayurveda:-
The ancient Ayurvedic scholars were well aware of the fact of ageing and related disorders. They have given the term ‘Jara’ (Old age) as a synonym to the disease process. A unique description of ageing process is given by Acarya sarangdharma.

Balyam vriddhiscchavir metha Twak drsti sukra vikramau

Buddih Karmendriyam ceto jivitam dasato hrseta
(S.S.Pu. 6/19)

Aforesaid verse narrated that a growing human being loses following physiological specialities during each decade of life, starting form Balyam (childhood), Vriddhi (Growth), Chhavi (Good looks), Medha (Memory), Twak (Skin), Drsti (eye sight), Sukra (Semen), Vikram (Strength), Budhi (Intellect) and Karmendriyam (Organs of action). This is a simple and scientific definition touching almost all the important factors of ageing.

Vayatah pariksha described under the heading of Dasa vidha Atur Pariksha (C.V.8) Signifies, whether the physical appearance of the patient is according to the actual age or not. It is an important observation made during the clinical examination of a patient. It is considered to be a reflection of healthy status of the individual.

Antioxidants and Ageing process:-
Antioxidants are the substances, which protect against the injurious effects of oxy radicals. Scavengers interact with free radicals and thereby inhibit the reaction of formation of free radicals.

Endogenous Antioxidant Mechanism.

Enzymatic:
- Mitochondrial Cyt. Oxidase system.
- SOD (super oxides dismutase)
- Catalase
- Glutathions peroxidase system

Non Enzymatic:-
- Membranous (Lipid phase)
- Alpha-Tocopherol
- Beta-Carotene
- Non membranous (Aqueous phase)

Ascorbic acid
Orate, Cysteine, Albumin, Ceruloplasmin, Transferin.

Anti ageing effect of Vitamin A,C, E and Selenium have been well studied but available evidences do not support the routine use of these for life extension or antiageing drugs.

Studies have also established that there is no dose response relationship between the mortality and Vitamins supplementation.
Dietary antioxidants use although has increased the life expectancy, actual increase in life span was observed in one animal.

Rasayana remedies and Ageing:-
Rasayana Tantra is an important branch of eightfold Ayurveda. This particular branch concentrates on the prevention of disease process rather than cure. It may prevent or slow down the Ageing process, as it is evident in the following definitions.

Labhopayo hi Sastanam Rasadinam Rasayanam (C.Ci.1/8)
Yajjara vyadhinasanam tad rasayanam (S.S Pu.4/13)
Yajjara vyadhinasanam tad vrisyam tad Rasayanam (Sushruta)
Svasthasy orjaskaram Yat tad vrisyam tad Rasayanam (C.Ci 1/5)

Rasayana drugs advisable for different decades of life:-

- FIRST DECADE (B- ALAYAVASTHA)- VAC- A, SVARNA, K-ASMAR-I
- SECOND DECADE-(VIRDHI)- KASMARI, ASVAGANDHA, VALA
- THIRD DECADE-(CHHAVI)- LOHA,-AMALAK-I
- FOURTH DECADE-(MEDH-A)- SANKHAPUSPI, JYOTISMAT-I
- FIFTH DECADE-(TWAK)- PRIY-ALA, SOMARAJI, BHRINGRAJA, JYOTISMATI.
- SIXTH DECADE-(DRSTI)- TRIPHAL-A, SATAVARI, JYOTISMATI
- SEVENTH DECADE-(SUKRA)- PIPPALI, ATMGUPTA
- EIGHTH DECADE-(VIKRAM)- Medicines are not much use
- NINTH DECADE – (BUDHI)-
- THTNTH DECADE-(KARMENDRIYAM)
- Dirghamayu smritim Medha ….. Rasayanam (C.Ci.1/1)

The Rasayana and Vajikarana remedies of – Ayurveda act through the mechanism of specific molecular nutrition to the target organs Rasayana therapy is not a single drug treatment, but is a comprehensive and specialized regimen capable of causing healthful longevity and improved mental faculty by acting at the level of Rasa (nutrition). Agni (digestion and Metabolism and the srotamsi (microcirculation), thus, enabling the organism to procure the best qualities of different dhatus (Body tissues). Rasayana therapy is supposed to influence the very fundamental mechanisms of the living organism and to have rejuvenating effect of the body as well as mind.

Optimum benefits of rasayanatherapy:-
Rasayana remedies are required to be administered during the young age (P-urvam vayasi Madhye v-a….Sushruta). Proper purification of the body is desirable prior to the administration of these drugs (Charka Ci-1). In order to achieve optimum benefits from the therapy.

Psycho neurological ailments in elderly:-
The honour, respect and status conscious elderly people especially feel gradually secluded from the family as well as society, Generation gap had also been noted to be a factor of stress in elderly. This particular condition may precipitate the state of anxiety and depression. Variation of mood is widely associated with long lasting crippling diseases. Pain is such conditions may lead to demoralization and depression.

Most important disease occurring in elderly is dementia, Alzheimer’s type dementia is a
major health problem in countries with increased longevity of its people. Sooner or later it is going to be a problem in India as well, Dementia is characterized by a gradual decline in cognitive abilities, such as memory, language, orientation alertness, reasoning and judgement. Number of psychiatric complications like delusional disorders, hallucinations, depression, anxiety, personality alterations and agitation may be found in dementia of Alzheimer’s type. Ultimately the disease may proved to be fatal.

The outstanding pathological feature is death and disappearance of nerve cells is the cerebral cortex. This leads ultimately to extensive convolution atrophy, especially in frontal and medical temporal regions. Two kinds of microscopic lesions are distinctive for Alzheimer’s disease viz neurofibrillary tangles and Neuritis plaques. These pathological changes are supposed to be initiated as a result of injury by free oxygen radicals.

**Management:-**
It has been proved that the drugs like Amalaki and Amrita possess free radical scavenger property and may be used widely for the management of such ailments. Simultaneously use of medhya Rasayanas will alleviate the symptoms of anxiety, depression and other psychiatric manifestations. Though all the Rasayana drugs possess medhya effect of varying degree, but there are certain drugs having selective medhya Rasayanas property viz Mandukparni, Yastimadhu, Guduchi and Sankhapuspi (C.C.1-3:30-32).

In the same context caraka has also mentioned Aindri (B.Monniera) as a remedy to improve budhi and Medha. Use of these drugs may produce non specifically increased resistance against stressful situations (Singh R.H.et al 1977). Thus, it may reduce the state of anxiety and depression.

Medhya Rasayana may have pharmacological action similar to the Nootropic agents. It may bring positive effect on higher mental function without undue phycho stimulation. It may have effect on cerebral circulation and may enhance oxygen consumption and glucose utilization by the brain cells. Potentially it may be useful in cases of degenerative brain disorder.

**Rasayana drugs acting on different dhatus:-**

| Rasa            | Draksha, Kasmari, Kharjur etc. |
|-----------------|---------------------------------|
| Rakta           | Amalaki, Bhringaraja, Palandu, Loha etc |
| Mamsa           | Aswagandha, Rudanti, Bala, Salparni etc. |
| Meda            | Silajatu, Haritaki, Amrta, Guggulu etc. |
| Asthi           | Laksha, Banslocana, Prsniparni, Sukti, Shanka etc |
| Majja           | Loha, Vasa, Majja etc |
| Sukra           | Nagbala, Pippali, Atmgupta etc. |
COCULUSION:-

Ageing is a biological phenomenon associated with an imbalance between the oxidative stress, pro-oxidants production and antioxidant protection system. There are no consistent results with anti-oxidant therapy and increased longevity although search is still on. With increasing longevity the age related disorders are likely to be increased in 21st century. Keeping this in mind Rasayana drugs may be advised as food supplement as well as medicine to minimize the ageing and related disorders. Specially Medhya rasayana may be useful in the degenerative disorders of brain, like dementia of senile and Alzghimer’s types with the aim to correct the cognitive dysfunction and preventing the disease progression.

REFERENCES:-

1. Culter R.G. Evolutionary biology of ageing and longevity. In Johnson J.E.Jr. (Ed): Ageing and cell structure. Vol.2. Newyork, Plenum press, 1984: 371-378.

2. Culter R.G. Evolutionary perspective of Human longevity. In Andres R., Bieman E.I. Hazzard W.R. (Eds): Principle of Geriatric Medicine, New York, Mc grow Hill, 1985.

3. Culter R.G. Dysdifferentiation and ageing. In Sohal R.S. Birnboum L., Culter R.G. (Eds): Molecular biology of Ageing: Gene stability and Gene expression, New York: Raven Press 1985; 307-40.

4. Culter R.G. Anti oxidants and Ageing. Am. J. din. Nutr. (1997) (53:373-95)

5. Carak Samhita, Chaukhamba publication. Varanasi.

6. Singh R.H. Vrihattar Kayachikista, Vol.I, Varanaseya Sankrit samsthan publication, Varanasi,

7. Susruta susruta samhita, chaukhamba publication, Varanasi.

8. Sarangadhara Sarangadhara Samhita, Chaukhamba, Varanasi.

9. Thakur M.K. Biology and Molecular genetus of ageing.

10. Yadav R.K., Clinical & experimental study on Medhya effect of Aindri, Singh, R.H. MD (AY) thesis, B.H.U, 1995.

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