

Review Article

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SCOPE OF SHALYATANTRA IN GERIATRIC ANESTHESIOLOGY

Dr. Vaibhav Mishra

PG Scholar, Department of Shalyatantra, Parul Institute of Ayurveda

ABSTRACT

“Farther we Look Back, Further We Can See”

Ayurveda an ancient system of healing evolved since pre-vedic era which remarks “scripture of longevity”. Shalya tantra embraces all needful aiming at decluttering etiology manifesting pain or misery to body and mind. Sushruta the father of surgery was first person to used sangyahan on patient for plastic surgery in pre-ether Era.⁽¹⁾

Geriatrics derived from greek language “Geron” means “old man” and “iatreia” resembles healing. Anesthesia is born of surgery date back to centuries ago, started with origin of Vedana, that is as old as human being. Age alone is no longer a barrier to surgery, since anesthesia management in geriatrics depends on sound understanding of pharmacodynamics and pharmacokinetics aspects along with capacity to cope with the stress of illness and surgery. Maintaining quality Life span among geriatrics is valid aim of Shalyatantra Since primitive age and endeavoured to acheive painless condition for surgery, as Comorbidity is stronger predictor of outcome from surgery than age. Scope of Shalyatantra in geriatric anaesthesia is becoming advanced due to craving escalation in long life expectancy and facultative physiological reserves and motley comorbidity.

In this scenario, an attempt made to highlight the concern theme.

Keywords- Shalya Tantra, Geriatrics, Anesthesia

Geriatric Anesthesia:

Introduction

Vridhnavastha is the last part of the life span and is mainly characterized by degenerative changes. Aging refers to a multidimensional process of physical, psychological, and social change. The changes are always degenerative in nature.

The meaning of Sangyahanana-anaesthesia is reversible loss of sense. The importance of anesthesia was felt by surgeons since primitive age and they tried to achieve this painless condition for surgery and management of anaesthesia begins with pre-operative psychological preparation of patient.⁽²⁾

In Rigveda we find that legs have been amputated and replaced via iron substitutes, injured eyes have been removed out, and arrow shafts have been extracted from the limbs of the Aryan warriors. The story of the progress of Ayurvedic surgery is long and fascinating. It is evident that Acharya Sushruta the father of surgery was the first person who had described anaesthesia in the context of shalya karma (Surgical procedures) and has mentioned the use of Madya-wine to mitigate the pain of surgery.⁽³⁾

The approach to and management of surgery and anesthesia in geriatric patients is different and frequently more complex than in younger patients.

Increased life expectancy and reduced mortality from chronic age-related disease continue to enlarge that fraction of the surgical patient population considered elderly.

Surgical procedures in the elderly will continue to require a disproportionately large share of societal and institutional health care resources. Routine postoperative hospitalization and intensive care, especially after major trauma, are frequently protracted and may be further complicated by infection, poor wound healing and by multiple organ system failure for critically ill elderly patients. Of equal concern are recent findings that postoperative cognitive dysfunction may persist at least three months after otherwise uncomplicated surgery.

People are never more alike than they are at birth, nor more different or unique than when they enter the geriatric era. Optimal anesthetic management of geriatric patients

depends on the understanding of the normal changes in physiology, anatomy, and response to pharmacological agents that accompany aging. Therefore, precise assessment and appropriate perioperative management of the elderly surgical patient represents a great challenge to all medical health care providers.

The elderly population is expected to grow by 2030. Therefore, every practicing anesthesiologist will eventually become a subspecialist in geriatric medicine, with a special responsibility for delivering cost-effective health care to older adults.

SAMPRAPTI

The possible action of an anesthesia drug according to both Ayurvedic and modern sciences can be explained as follows.⁽⁴⁾

Medicine



Sensory Depression



Temporary Unconsciousness



Voluntary action & reflex loss



Sensory Loss



Motor loss

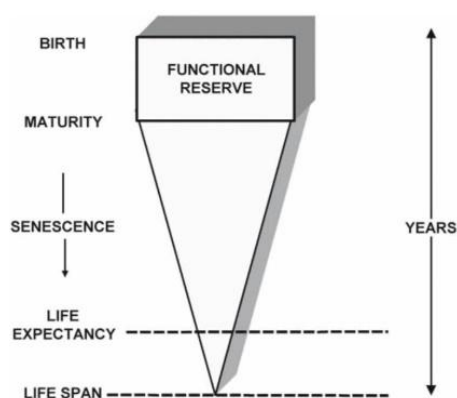


Cardio-respiratory loss (if high dose)

Pathophysiology of Aging

Age may bring wisdom but it also brings a greater chance of health problems. Processes of aging are usually distinguishable from age-related disease by the fact that they are universally present in all members of an elderly population and, in longitudinal studies of aging subjects, become progressively more apparent with increasing chronological age. Aging is a universal and progressive physiologic phenomenon characterized by degenerative changes in both the structure and the functional reserve of organs and tissues. It produces many physical manifestations due to reduced connective tissue flexibility and elasticity or the degeneration of highly structured molecular arrangements within specialized tissues.

The difference between maximum capacity and basal levels of function is organ system functional reserve, a "safety margin" available to meet the additional demands imposed by trauma or disease, or by surgery, healing and convalescence. Cardiopulmonary functional reserve, for example, can be quantified and assessed clinically using various exercise or maximal stress tests. However, there is at present no comparable approach to assessment of renal, hepatic, immune, or nervous system functional reserve. It is simply assumed that the functional reserve of these organ systems is reduced in elderly patients and that this is the mechanism by which the obvious susceptibility of elderly patients to stress- and disease-induced organ system de-compensation occurs.



Organ Functions in geriatrics in view of anesthesia⁽⁵⁾

1. Cardiopulmonary Function

- It reduces the cardiac end Organ response to Intrinsic adrenergic stimulation and to IMO tropic drugs particularly beta agonists.
- Less compliant and stiffer ventricular and atrial myocardial, Can make critical condition in elderly patient during anesthesia and surgery.
- Age related loss of tissue elasticity declines and may lead deleterious effects on gas exchange.
- Age related breakdown of alveolar septa reduces total alveolar surface area, limiting gas exchange and progressively increase anatomical and alveolar dead space .
- Geriatrics experience a higher incidence of transient apnoea and episodic respiration when given narcotics.

2. Hepatorenal Function

- Elderly women appear to metabolise BZD at rates close to that of younger females,yet elderly men do not.subtlephysiological changes-age and gender specific.
- Hepatic metabolism and drug bio transformation is significantly altered in this patient by their sustained exposure to poly pharmacy used to age related disease.
- Hepatic capacity for protein synthesis is significantly reduced by the 80's.
- Splanchninand hepatic blood flow is reduced proportionately.
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3. Renal Function

- Age related atrophy -30%is of bilateral renal tissue mass is lost by the 80's(from 270gms to 185gms of tissue).
- Increased Renal fat and diffuse and generalised interstitial fibres.
- More than 1/3 of glomeruli and nephron tubular structures disappear by the age of 80 years .In remaining glomeruli -10-20 % Of them are affected by sclerosis-It impairs effective filtration by producing dysfunctional continuity between,afferent and efferent glomerular arterioles.
- Total renal blood flow falls almost 50 %.
- Renal plasma flow and GFR decreases more rapidly.GFR is reduced less than RPF.
- Excretion of water load is delayed.

- Diminished thirst, poor diet, diuretics for age-related hypertension. Intravascular and intracellular dehydration reduced renal blood flow and loss of nephron delays drug clearance and prolonged clinical effects of injectable anesthetic drug used pre-operatively.

4. Metabolism and body composition

- Reduction in rate of body heat production and impairment of thermosensitivity and efficiency of autonomic thermoregulation increase the risk of inadvertent intraoperative hypothermia; decrease in core body to almost 1° C per hour.

5. Central nervous system

- Loss of nervous system tissue reflects attrition of neurons especially in grey matter, the most metabolically active, those that synthesize neurotransmitters.
- Autoregulation of cerebral vascular resistance (CVR) in response to change in arterial B.P. is well maintained, and the cerebral vasoconstrictor response to hyperventilation remains intact in healthy aged.
- Increase in number of cholinergic receptors at the end plate and surrounding areas, so despite loss of the skeletal muscle, dose requirements for competitive neuromuscular elections are not reduced, and are frequently slightly elevated.

Scope Of Anaesthesia In Geriatric

- Management of anesthesia and better operative outcomes begins with preoperative psychological preparation of the patient thus approach of proper counselling is need of hour.
- Revolutionary development can be achieved by establishment of different Basti and Virechan as preoperative measure.
- Nearly half of all surgical procedures involve patients older than age 65, and that percentage is likely to increase. Thus, the perioperative care of the older patient represents one of the primary future frontiers of anesthetic practice.
- Jara "old age" is one among 8 branches of ashtanga ayurved, the sub speciality of geriatric anaesthesia can become a part of mainstream in Shalyatantra and an

Ayurvedic protocol can be established for planning anesthesia in consideration of diminished physiological reserve and underlying comorbidities.

- **OCD and Post-Operative Delirium**-This is a more serious condition and precise etiology of it remains obscure and the subject of further research so, efforts to reduce the incidence and how to cope with them to be done by researchers .
- **Spinal Herbal Analgesia**-Drugs like tagara, ashwagandha, vacha etc. can be used the epidural route's advantage over conventional intravenous analgesia include superior analgesia ,improved function, less sedation and quick discharge from hospital.
- **Pre-Cognitive Test**-Geriatric patients are more sensitive to various anesthetic drug because age alters both pharmacodynamics and pharmacokinetics aspect of anesthesia management, hence advanced pre-anesthetic checkup can be incorporated in view of Dosha, Dhatu and Prakriti assessment to reduce the fatal risk in geriatrics.
- Innovative challenging observational study can be done pertaining to the intraoperative management of critically ill geriatric patients & postoperative management, emphasizing postoperative respiratory and cognitive complications, as well as acute and chronic pain.
- Detailed deep study is required to evaluate analgesic and anti-inflammatory properties and unfold other properties of Ayurvedic herbal drugs used as premedicants for geriatric patients, as traditional anesthesia has slowly but surely it works, thus with the help of latest research and new formulation, evolved into a spectrum of hope and vision of the future to the surgeon.
- There are a number of analgesics for post-operative pain management. But all the analgesics available have side effects such as gastrointestinal perforation, ulceration, bleeding altogether no analgesic can give complete analgesia in the post operative pain management. Therefore to search an indigenous drug for post operative pain management is having better scope for scientific research work.
- An innovative thrust incorporated in search to evaluate the experimental anesthetic effect of herbal drugs in the form of extract & to reduce quantity of modern

anesthetic drugs by addingherbal anesthetic drugs for safe geriatric surgical outcome.

- The main purpose of pre-anesthetic or premedication is to facilitate the smooth induction and maintenance of anesthesia during operation. This is only possible by administration of drugs which relieve the patient's anxiety, apprehension and fear about the operation as well as it helps to relieve emotional tension, lowers metabolism, reduces salivary and respiratory tract secretions, prevents undesirable autonomic reflex responses to stimuli and decreases the side-effects of the anesthetic agents, thus should come up with an effective, safe ayurvedic alternative to conventional treatment with minimal side effects in mentally retarded patients.
- It is truly an applied medical science of all the medical faculties, and has proved to be one of the 3 "A"s - **Anesthesia, Asepsis and Antibiotics** - a millennium contribution for the tremendous advances made by the surgical care and pain management.
- Besides some ayurveda drugs like Vacha, Ashwagandha, Bramhi, Parijata and Parasikayavani were described by numerous research scholars to utilize as premedicants for achieving hypnosis & post operatively to truncate pain, swelling and solicitousness in the patients. However a chief herbal anesthetic agent is still awaited.⁽⁶⁾
- Till now only drugs invented for post operative tranquility so indigenous anesthetic drugs are to be explored to encounter the toxicity or side effects of modern anesthesia altogether reducing the dose of anesthesia with maximal potentiating the effects.
- **PCA(Patient Controlled Analgesia-)** It's on demand at current scenario, intermittent self administration of analgesic drug by patient. It's predominantly used is to deliver opioid by those who need to alleviate pain for longer so, other herbal extracts drugs can be administered in this way to cope with geriatric need as in this patient will express high satisfaction because it leads rapid relief altogether patient has self administering control by their own.

- **ERP's-(Enhanced Recovery Programs)**-It aims to reduce detrimental effects by reducing surgical stress and reducing or preempting the metabolic changes occurs in old age.⁽⁷⁾
- **Geriatrics Accidental Hypothermia**-Heat in geriatrics may be lost during anesthesia hence in duration body temperature should be monitored during lengthy surgery considering old age physiology. It may be prevented by increasing the environment temperature, keeping patient covered by warm blankets, warm IVFs. A strong preventive vision needed in this aspect.

Conclusion

In this age of rapidly expanding medical knowledge, including new surgical and anesthesia techniques, drugs, equipment and technology, along with an emphasis on patient safety and quality of care, all within an environment of cost containment and incentives for production efficiency, patients with chronic and complex medical conditions will continue to present for surgery. At the end of the day, following standards of care and the need for cooperation and collaboration among health care professionals is needed. Surgery of any kind involves pain unless the surgeon is able to conduct his operations painlessly. The Ayurvedic surgeons are still lacking to get an effective measures & safe anaesthetic drug for use during geriatrics surgery and safe management. Researcher should work extensively in this stream full of fruitful scope. As Surgery is our ancient wisdom and we are equally beneficiary of newer development in field of science.

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