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Anaesthetic Challenges in Extreme Geriatric Patients.

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ABSTRACT

Life expectancy in India has steadily increased from just above 40 in the 1960s to 66 in the current decade. This is in parallel with the global average. An increasingly ageing population is also in need of increasingly complex medical procedures. It is not uncommon to encounter surgical patients in extreme geriatric age groups. But centenarian surgical patients are rare and present a unique challenge to anesthesiologists. We hereby present a case of 106 year old lady posted for radical mastectomy and the risk factors in anesthetizing a centenarian geriatric patient.

Keywords: geriatric anesthesia, centenarian, physiological changes with increasing age, Anaesthetic challenges.

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INTRODUCTION

Previously above the age of 50 was a contraindication to undergo surgical procedures. With the advances in both medical and surgical care, patients come forward to undergo surgeries to enhance their comfort of living during the golden years.

We present a case of the extreme geriatric age – 106 years old posted for radical mastectomy and the challenges we encountered.

Case report

A 106 year old, ill edentulous female patient weighing 25 kgs diagnosed as infiltrating ductal carcinoma of right breast – grade II diagnosed by wedge biopsy, posted for palliative modified radical mastectomy. She was suffering from cognitive dysfunction, loss of hearing, visual impairment & irrelevant speech; hence communication with her was difficult. We got the history from her daughter. She is a known case of Asthmatic bronchitis on tablet Deriphyllin 150 mg for the past 20 years. There was no other co morbidity.

On clinical examination

Small built with loss of skin elasticity, muscle mass & subcutaneous fat
CVS – S1, S2 heard, HR- 70/minute, regular. BP was 130/80 mm of Hg.
RS - NVBS. No added sounds

Her pre-operative blood investigations were normal.

ECG showed ST segment depression in anterior leads.

ECHO showed EF: 57% normal LV systolic function, no regional wall motion abnormalities, grade I diastolic dysfunction, mild mitral regurgitation, mild pulmonary hypertension and mild tricuspid regurgitation.

Chest X-Ray showed increased bronchovascular markings and calcified blood vessels. Assessed under ASA IV.

Anaesthetic management



In the operating room, starting an intravenous line was difficult due to loss of skin's elasticity & subcutaneous fat and thin veins. Monitors included ECG, Pulse oximetry, Non Invasive BP, Temp and EtCO₂. Premedication was with Inj Glycopyrrolate 0.2mg and inj Fentanyl 50 mcg. Induction with Inj Thiopentone 125mg and Inj Atracurium 15mg. Mask ventilation was managed with oral airway, definitive airway was achieved with oral ETT 7.0mm ID. Eyes were protected with soft pads and padding of all the bony prominences was done to prevent pressure sores. Procedure was uneventful. Intraoperatively all the vital parameters were maintained within normal limits. Patient was extubated after administration of reversal.

Duration of surgery – 1hr 30minutes, Blood loss was within acceptable limit. She was alert, conscious, maintaining adequate tidal volume, all vital signs were normal. Patient was shifted to SICU, she was discharged on the seventh day. She was not advised any chemotherapy or radiotherapy.

Discussion

Physiological changes in geriatric age group

Central nervous system: With advancing age there is continual loss of neuronal substance, decreased cerebral blood flow and neurotransmitters. Decline in autonomous nervous system function leads to decreased responsiveness to beta adrenergic stimulation. Reduced requirement of anesthetic agents, reduced MAC (4% decrease every decade after 40). Post-operative cognitive dysfunction is increased with age [1, 2]. Reduction in epidural space with increased permeability of dura. Peripheral nervous system – inter Swann cell distance is reduced so is conduction velocity, so more sensitive to neuraxial & nerve blocks [3].

Cardiovascular system: Cardiac myocyte & SA node cell number is decreased. Decrease in cardiac output and stroke volume; decrease in exercise tolerance. Progressive loss of vascular elasticity causes compensatory left ventricular hypertrophy. LV compliance is reduced. Reduced baroreceptor sensitivity [4, 5]. Incidence of coronary arteriosclerosis, IHD, Cardiomyopathy and valvular heart disease increases with increasing age.

Respiratory system: Loss of elastic recoil with altered surfactant production leads to decrease in lung compliance. Protective reflexes like coughing and swallowing diminished with reduced hypoxic and hypercarbic drive, increased work of breathing, decreased chest wall elasticity and muscle strength, increasing turbulent flow in narrow airways. Early collapse of the smaller airways leads to increase in closing capacity. Progressive loss of alveolar surface resulting in increase in anatomical dead space, decreased diffusion capacity, impaired gas exchange. Residual volume increased, VC decreased, CC increased, V/Q mismatch with increased A-a O2 gradient [6].

Normal age	Range of PAO2 mm of Hg
20 to 29	84 to 104
30 to 39	82 to 101
40 to 49	78 to 98
50 to 59	74 to 94
60 to 69	71 to 91

Gastrointestinal system and Liver: Gastrointestinal motility and sphincter function are decreased. Hepatic tissue mass along with its synthetic and metabolic capacity decreases. Less plasma protein binding and slower hepatic conjugation.

Renal system: Renal tissue atrophy occurs, there is 50% decrease in the number of functioning glomeruli by age of 80 with a 1-1.5 % decline in glomerular filtration rate per year. Diminished renal elimination of drugs . Decreased renal blood flow and creatine clearance.

Endocrine glands: They tend to atrophy leading to Diabetes, Hypothyroidism, Impotence and Osteoporosis. Chronic electrolyte abnormalities are also common in the elderly.

Haematological system: Cellular elements in the bone marrow are produced at a reduced rate. Anaemia causes reduced oxygen carrying capacity. Compromised cellular immunity- leukocytopenia and lymphocytopenia. Incidence of cancer is > 25% after 65 years of age.

Musculoskeletal system: Loss of skeletal mass and decreased percentage of body fat. Osteoporosis occurs with decreased bone density and increased bone fragility leading to susceptibility to fractures. Osteoarthritis

prevalence is greater in women. Weight bearing joints are affected- knees hip cervical and lumbosacral spine . Cervical spine mobility and stability are necessary for laryngoscopy and tracheal intubation as cervical osteoarthritis can cause difficulty in visualizing the glottis opening.

Other related diseases: Dementia, Parkinson's disease, poly pharmacy, frailty, delirium, depression, immobility, hypothermia, chronic pain.

Frailty refers to loss of physiological reserve that makes a person vulnerable to disability during & after stress .

Post operative problems

Common problems are respiratory complications.

Bronchitis – 12% Delirium – 17%

Pneumonia – 10% Focal neurological signs – 1%

Atelectasis – 17% CCF & MI – 6%

GA vs RA

Regional Anesthesia may provide some benefits; prevent post-operative inhibition of fibrinolysis, reduce the incidence DVT & Pulmonary embolism. [7, 8]

CONCLUSION

Our patient though she had all the problems of geriatrics, our meticulous assessment, team discussion before surgery, intraoperative & post-operative vigilance monitoring, we were able to discharge her without a single complication.

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