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## *DEPARTMENT OF OPERATION THEATRE AND ANAESTHESIA TECHNOLOGY*
## *3rd YEAR*

## *PAPER 2:PRINCIPLES OF ANAESTHESIA-2*

## *<u>TOPIC:GERIATRIC ANAESTHESIA</u>*

# *PHYSIOLOGICAL CHANGES IN OLD AGE:*

## *CARDIOVASCULAR SYSTEM:*

- *Decreased ventricular compliance leading to diastolic dysfunction is the most common finding in old age*
- *Hypertension ,aortic stenosis and coronary artery disease are the often cause for diastolic dysfunction*
- *Systolic function usually remains preserved*
- *Blood pressure increases with age*
- *Decreased heart rate,decreased adrenergic response and decreased cardiac reserve incerase the incidence of cardiac complications.*

## *RESPIRATORY SYSTEM:*

- *Decreased elasticity leads to alveolar distension and increase in residual volume and functional residual capacity.*
- *Kyphosis and Scoliosis can cause difficulty in ventilation*
- *Decreased respiratory muscle function decreases the cough reflex*

## *CENTRAL NERVOUS SYSTEM:*

- *Loss of neurons decrease the brain reserve leading to dementia*
- *There occurs increased sensitivity to anaesthetic medications*
- *The risk of perioperative delirium and postoperative cognitive dysfunction is for more common in old age people*

*Renal and Hepatic:*

- *There occurs age-releated decreases in renal and hepatic functions*

*Thermoregulation:*

- *Geriatric population is more prone for hypothermia*

*ANAESTHETIC MANAGEMENT:*

- *Age is not contraindicated for any surgery*

*Pre-operative:*

- *Commonly coexisting disease of the old age like hypertension,ischemic heart disease,diabetes mellitus,cerebrovascular disease,chronic obstructive pulmonary disorder,rheumatoid artheritis,parkinson's disease,alzheimer's ,malignancies must be ruled out by detailed preoperative assesement*

- *Medical condition should be stabilized as for as possible*
- *Many of the old age people are on poly pharmacy,a detailed record of medication sholuld be obtained and instructions are given accordingly*
- *Assessment of cognitive function is must in patients with preoperative dementia have higher incidence of postoperative delirium.Moreover,it can be used to compare if patient develops cognitive finction in postoperative period.*

*<u>INTAOPERATIVE:</u>*

*<u>CHOICE OF ANAESTHESIA:</u>*

- *Regional anaesthesia is preferred over general anaesthesia due to the following reasons*
- *Increased sensitivity of brain to anaesthetic agents can prolong the recovery*
- *Decreased metabolism and exertion due to decreased hepatic and renal function increases the chances of drug toxicity.*

- *Central neuraxial blocks decrease the risk of thromboembolism*
- *Pulmonary complications associated with general anaesthesia may be avoided*
- *The incidence of postoperative delirium is less in regional anaesthesia as compared to general anaesthesia*
- *However,regional anaesthesia particularly central neuraxial block may be technically difficult due to degenerative changes in spine*
- *Old age patients achieve higher level of spinal and epidural due to narrowing of spaces*
- *Geriatric population is more sensitive to the effect of local anaesthetics during nerve blocks.*

*GENERAL ANAESTHESIA:*

*PREMEDICATION:*

- *As the requirement of benzodiazepines may be reduced by 50%,premedication with benzodiazepines sholuld be done contionously.*

*INDUCTION:*

- *Incrase senstivity of brain,decrease volume of distribution,decreased unbound fraction of the drug(due to decreased albumin levels)and reduced metabolism and clearence not only decreases the dose of all IV agents but also increases the toxicity.profol because of shorter half life is preferred.decreased cardiac output may slow the onset with IV agents.*

*INTUBATION:*

- *Decreased pseudocholinesterase levels due to decrease hepatic functions may therotically prolong the effect of suxamethonium however,clinically no prolongation has been seen*
- *Intubation and mask ventilation may become difficult due to edentulous jaw and decreased neck movements*
- *Stress response to cope up with heamodynamic changes during surgery and anaesthesia decreases*

*MAINTENANCE:*

- *The minimum alveolar concentration of inhalational agents decreases by 4-6% per decade*
- *Desflurane because of its rapid emergence and least metabolism is the preferred inhalational agent for geriatric anaesthesia*
- *Doses of opioids should be reduced by half*

- *Remifentanil because of its ultra short life is the most preferred opioid.*

*MUSCLE RELAXANT:*

*Decreases cardiac output can delay the onset of muscle relaxants.hoffman degradation makes atracurium and cis atracurium to be the muscle relaxants of choice for old age patients.*

*POSTOPERATIVE:*

- *Studies have shown that there occurs age releated decrease in pain perception and moreover these patients are oversensitive to opioids,therefore opioids shoulld be used very carefully*

*POSTOPERATIVE COMPLIATIONS:*

*Geriatric population is more prone for hypoxia and urinary retention in post operative period.*

## *POSTOPERATIVE DELIRIUM:*

- *The overall prevelance of postoperative delirium in older patients is estimated to be 10% ,this incidence of delirium can increase to more than 50% in patientsshifted to ICU*
- *Important predisposing factors are age>65 years,male gender,major surgery,general anaesthesia,drugs like pethidine,pre operative cognitive or functional impairement,dementia,associated comorbidities,polypharmacy,electrolyte imbalence,pain and sleep deprivation.*

## *POST OPERATIVE COGITIVE DYSFUNCTION:*

- *Short term upto 3 months changes in cognitive function have been very well documented in 10-15% of geriatric population after surgery.long term >3months cognitive impairement can also occur in 1% of the patients.*

- *The incidence of postoperative cognitive dysfunction is independent of both surgery and anaesthesia.studies have shown no difference in the incidence of post operative cognitive dysfunction in minor versus major surgery and regionalversus general anaesthesia*
- *At present there is no specific treatment available for post operative cognitive dysfunction(POCD)*

# THANK YOU