

Anaesthesia for Mentally Challenged Children

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Mentally challenged is the new terminology used for Mental retardation (MR).It is a generalized disorder, characterized by significantly impaired cognitive functioning and deficits in two or more adaptive behaviors with onset before the age of 18. It has historically been defined as an Intelligence Quotient score under 70

Signs and symptoms....

Children with mental retardation may learn to sit up, to crawl, or to walk later than other children, or they may learn to talk later. Both adults and children with mental retardation may also exhibit the following characteristics:

- Delays in milestones
- Deficits in memory skills
- Difficulty learning social rules
- Difficulty with problem solving skills
- Delays in the development of adaptive behaviors such as self-help or self-care skills
- Lack of social inhibitors

Aetiology: Multifactorial

Congenital: eg-Down syndrome, Cretinism fetal alcohol syndrome and Fragile X syndrome

Problems during pregnancy: eg- Alcohol, rubella,Asphyxia

Accuired : eg-Measles or meningitis can cause mental disability if medical care is delayed or inadequate. Malnutrition and Exposure to poisons like lead or mercury

Cerebral Palsy

Non progressive disorder of the brain

- Motor Weakness
- Choreoathetosis
- Hypotonia
- Ataxia

- Distonia
- Spasms
- Various degree of mental retardation

The cerebralpalsy may be the result of birth asphyxia, neonatal infection or trauma.

Functional classification of cerebral palsy

- **Class I-** No limitation of activity
- **Class II** Slight to moderate limitation
- **Class III** Moderate to great limitation
- **Class IV** No useful physical activity

These children often require multiple surgical procedures. Orthopaedic operations to improve function of the extremities are common, and some patients require surgical correction of progressive spinal deformities. Common procedures include surgical soft tissue procedures that reduce muscle spasm around the hip girdle, including an adductor tenotomy or psoas transfer and release.

Pre Operative Assessment & Planning

Respiratory Problems: Recurrent Pneumonia due to Chronic aspiration And Ineffective cough And they may be in various extent of Antibiotic therapy. Long standing Scoliosis leads to Restrictive lung disease.

Neurological problems: Wide range Mental retardation and Seizures will be present and they will be on Anticonvulsants like Phenytoin Phenobarbitone and Valporic acid. Spasm of muscle Will lead to Abnormal Gait

Gastro Intestinal: Gastro oesophageal reflux is common and Pooling of secretion in oropharyngeal area leads to Aspiration.

Nutritional problems: Most of them are Undernourished, Anaemic and Associate with Vitamin deficiency. Many a time they are Obese also

Air way : Potentially difficult laryngoscopy is because of dental caries, loose teeth, and an increased incidence of temporomandibular joint dysfunction

Intraoperative management

Propofol for intravenous induction is a good choice since many children with CP have reactive airway disease

Rapid sequence induction is considered if a history of gastroesophageal reflux is present. Tracheal tube size selection should be based on their age.

Musclerelaxant: CP children are Sensitive Succinylcholine. But clinical significane could not be established and dangerous hyperkalemia –rare. Studying train-of-four responses in a severely affected limb may not represent the actual state of neuromuscular blockade and the degree of block can be underestimated.

Inhalation agents : Halothane, Sevoflurane **and** Isoflurane can be used. But the MAC requirement is nearly 20% less than in normal children.

Narcotics: These drugs have greater potency in children who have CP. Doses need to be reduced, and greater vigilance is necessary to ensure maintenance of a patent airway during post extubation period.

Postoperstive pain relief: Pain relief by combining regional technique with systemic analgesic to be followed.

Downs Syndrome

It occurs in 1 in 800 live birth as a result of chromosome trisomy 21.

The clinical features of interest to Anaesthesiologist are Mental retardation, Small for age and variable degree of hypothyroidism.

Airway compromise can occur due to microbrachycephaly, short neck, Microglossia, mandibular hypoplasia, prominent tongue, narrow nasopharynx, subglottic stenosis, hypotonia of the pharyngeal muscles and cervical spine instability. Due to the above fact intubation may be difficult and post extubation stridor is common.

Congenital heart disease incidence is 40-50%. VSD, ASD, TOF and PDA are the most common defects. Pulmonary hypertension due to the congenital heart disease or due to chronic pulmonary hypoxemia is an added feature. Vascular access is difficult due to small size of the vessel and less supportive tissue.

These patients are subjected ophthalmic surgery like congenital cataract or correction of CHD or incidental surgery.

. Thyroid function test and supplementation and cardiac evaluation is mandatory for elective surgery. Sensitivity to atropine is controversial. Induction agent to be chosen as per the cardiac status and vascular access. Titrated dose of Muscle relaxant to be used because of hypotonia and reduced muscle mass. Neuromuscular monitor is useful in titrating the muscle relaxant dose and reversing the effect. In view of atlanto

occipital sublexation, care should be taken in positioning the patients head for intubation and during surgery.

Congenital Hypothyroidism(Cretinism)

Many of them are at variable degree of mental retardation. Their thyroid functional state should be assessed prior and oral supplemental therapy to be given before elective surgery. For emergency surgery intravenous thyroid hormones with hydrocortisone to be given to prevent Myxedema coma. In order to prevent arrhythmia and ischemia in cardiac surgery and procedures it is advisable to start the therapy postoperatively . Airway problem due to big tongue and hypotonia are common. Judicial use of all anaesthetic drugs is mandatory since the drug metabolism is delayed to various extent.

There are many established congenital syndromes associated with mental retardation. It has to be planned as per the procedure and clinical condition and Anaesthesiologist should not hesitate to obtain second opinion from Pediatrician or Neurologist.