orphananesthesia

Anaesthesia recommendations for patients suffering from

Fragile X syndrome

Disease name: Fragile X syndrome

ICD 10: Q99.2

Synonyms: FXS, FraX syndrome, Marker X syndrome, Martin-Bell syndrome

Disease summary: FXS is the most common cause of inherited intellectual disability, affecting up to 1 in 2,500 males and 1 in 4,000 females. Triplet-repeat expansion in the FMR1 gene leads to a loss of function in FMRP, a regulatory protein linked to neuronal development and plasticity. Clinical features of FXS are rather unspecific and genomic testing is mandatory to confirm the diagnosis. FXS may present itself in many shapes from mild learning difficulties to severe mental retardation and the extent of disability correlates with expression levels of FMRP. For its X-linked nature, female patients with a normal allele can present a very mild phenotype. Muscular hypotonia and speech delay usually allow for an early diagnosis before the age of three. However, due to the uncharacteristic nature of associated symptoms diagnosis may be delayed until later childhood or adolescence.

Besides cognitive dysfunction, the full clinical picture of FXS is often characterized by severe behavioural abnormalities such as anxiety, autism, attention-deficit, hyperactivity, and (auto-) aggression. Up to 20% of FXS-patients may develop – mostly benign forms of sleep - epilepsias. Physical features may comprise a long and slim face, prognathism and rather prominent ears. Macroorchidism is very common in males and may be associated with infertility. Weak connective tissue can lead to hyper-extensible joints, and some reports claim a higher incidence of mitral valve prolapse and aortic dilatation in FXS. There is a high prevalence of obstructive sleep apnoea in FXS.

Medicine in progress

Perhaps new knowledge

Every patient is unique

Perhaps the diagnostic is wrong

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Typical surgery

A higher prevalence of OSAS and chronic otitis media in patients with FXS may lead to ORL-surgery. Non-cooperation with diagnostic procedures will make (analgo-)sedation or anaesthesia necessary for a variety of investigations (e.g. MRI).

Type of anaesthesia

With pronounced mental and behavioural impairment, general anaesthesia or (analgo-) sedation will become unavoidable.

There is no data available to advise or disadvise any specific regime of anaesthesia or airway management.

Regional and/or local anaesthesia should however be used to supplement postoperative pain management.

Necessary additional diagnostic procedures (preoperative)

Neuropaediatric evaluation is likely to be available to assess the severity of mental and/or behavioural impairment.

Investigations clarifying whether any cardiac or respiratory abnormalities are present would be very welcome but are likely not to be available because of poor cooperation from the affected.

If feasible, ECG and echocardiogram are advisable.

Particular preparation for airway management

There is no data suggesting a higher incidence of a difficult airway in patients with FXS. Nevertheless, in cases with a pronounced prognathism means of difficult airway management should be available.

Particular preparation for transfusion or administration of blood products

Not reported.

Particular precautions for positioning, transport or mobilisation

Soft tissue weakness must lead to special attention towards patient positioning, especially under the influence of muscle relaxants.

The proverbial un-rest in patients with FXS will most likely facilitate early mobilization and prophylaxis of thromboembolism.

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Probable interaction between anaesthetic agents and patient's long term medication

Many patients will receive antiepileptics and stimulants or antidepressants for behavioural disorders. Induction of or competition in metabolic pathways has to be taken into consideration with drug dosing in FXS.

Anaesthesiologic procedure

Take extra precautions to provide stress- and anxiety-free surroundings.

Take your time for premedication. If they seem able to help, keep parents or other guarantors close for premedication and recovery.

Benzodiazepines are first choice agents for premedication in patients without OSA for their anxiolytic effect. Aim for higher doses. Beware of adverse clinical effects through alterations to explicit perception and memory. Abstain from ketamine for lowering of seizure threshold.

Alternatively, establish i.v. access well before (on the ward), propofol may then be titrated towards effect for premedication/sedation.

There is no data available to advise or dis-advise any specific regime of anaesthesia or airway management.

Particular or additional monitoring

Single reports suggest a need for higher doses of premedication and anaesthesia. Depth of anaesthesia monitoring could be helpful to detect such cases.

Possible complications

Intraoperative complications have not been reported in FXS.

Agitation may lead to harm to equipment or the patient and has to be anticipated or best avoided.

Postoperative care

Make parents or other trusted persons available for the recovery period to avoid agitation and anxiety. Return the patient to his familiar surroundings as soon as possible.

Avoid discomfort that might lead to stress. Provide normothermia and pre-emptive post-OR analgesia. Consider PONV-prophylaxis.

Remove all strips and strings not necessary for the recovery phase.

OSAS may be present, take this into account when administering opioids or benzodiazepines. Prolonged patient observation and apnoea monitoring might be necessary.

Information about emergency-like situations / Differential diagnostics

Prepare for seizures.

Make sure neuro- and psychopharmacons are administered as far as possible in the peri-operative period.

Remember that there might be an undiagnosed cardiac abnormality to consider in an unstable patient.

Ambulatory anaesthesia

Ambulatory anaesthesia should be able to provide organizational structures suitable for patients with mental and behavioural abnormalities.

The concept of “ambulation”, an early return home, can be highly beneficial in patients with FXS.

Obstetrical anaesthesia

In most cases, females suffering from FXS are less affected because they have a normal allele to compensate for their fragile X. There are no reports suggesting an increase in parturient disorders.

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These guidelines have been prepared by:

Author
Johannes Prottengeier, Anaesthesiologist, University Hospital Erlangen
Johannes.prottengeier@kfa.imed.uni-erlangen.de

Peer revision 1
Ulrike Gaiser, Competence Centre Fragile X Tuebingen, Department for Neuropaediatrics, University of Tuebingen, Germany
ulrike.gaiser@med.uni-tuebingen.de

Peer revision 2
Frank Kooy, Department of Medical Genetics, University of Antwerp, Belgium
Frank.Kooy@ua.ac.be

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