

Anaesthesia recommendations for patients suffering from **Gaucher disease**

Disease name: Gaucher disease

ICD 10: E75.2

Synonyms: sphingolipidosis (lysosomal storage disorder, deficiency of glucocerebrosidase)

Disease summary: Gaucher disease is one of the most common lysosomal storage disorder with defects in the enzyme glucosylceramidase (glucocerebrosidase). The disease is caused by mutations in the GBA gene on chromosome 1, (autosomal recessive) and affects both sexes. Incidence of disease is estimated to be 1:40000 in Europe. Most commonly, disease is differentiated into a non-neuronopathic form and a neuronopathic form. Thus, patients may present with symptoms early during childhood or later in life. Patients may develop organ damage with some anaesthesiologically relevant manifestations in the coagulation system, impaired immune competence, reduced lung function and elevated pulmonary arterial pressure in adults. Importantly, specific therapy with eliglustat may interact with perioperative medication and should be paused for 48h before surgery. Neuroaxial anaesthesia, regional-anaesthesiological nerve blocks and general anaesthesia can be performed safely in these patients with individual risk assessment.

Medicine in progress



Perhaps new knowledge

Every patient is unique

Perhaps the diagnostic is wrong



Find more information on the disease, its centres of reference and patient organisations on Orphanet: www.orpha.net

Typical surgery

Patients with Gaucher disease may present for all types of surgery. However, as disease can lead to splenomegaly and also was described to be associated with femoral head necrosis and bone pathology, spleen extirpation and musculoskeletal surgery are typical for these patients.

Type of anaesthesia

The anaesthesiologically relevant aspects in Gaucher disease are related to

- Haematopoietic system with anaemia, thrombocytopenia, impaired coagulation capacity and leucopenia with impaired immune competence
- Impaired lung function
- Impaired CNS function including epilepsy and dysphagia
- Pulmonary arterial hypertension in adult patients e.g. receiving enzyme replacement therapy

Based on current knowledge, all types of anaesthesia can be performed safely. Choice of anaesthesia should closely be related to specific manifestation of individual patients. If possible, regional-anaesthesia could be preferable especially in patients with pulmonary complications but should be evaluated carefully against the background of potential coagulopathy. In general anaesthesia, volatile and intravenous hypnotics can be administered. In patients with history of coagulopathy or abnormal laboratory coagulation tests, neuroaxial anaesthesia should be avoided.

Necessary additional diagnostic procedures (preoperative)

Standard preoperative measures to evaluate patients and interdisciplinary case review (e.g. involving surgeon, anaesthesiologist and haematologist) will allow individualized decision making for additional diagnostic testing. This should also focus detailed patient history of clinical signs of bleeding (e.g. gum bleeding, heavy menstruation bleeding, spontaneous hematoma) and obtaining blood tests. Standard coagulation tests (partial thromboplastin time, INR, blood count) can be expanded to identify impaired hemostasis like thrombocytopenia (thromboelastography) or deficiency of coagulation factors.

Furthermore, pulmonary and cardiovascular capacity should be evaluated to assess metabolic equivalents and signs for cardiac decompensation (as described in guidelines for evaluation of adults before non-cardiac surgery). In specific cases, ECG and transthoracic sonography should be performed to determine ejection fraction, valvular defects (like tricuspid insufficiency) and elevated pulmonary-arterial pressure. Specific attention should also be paid to medication intake of patients as some patients may be treated with eliglustat (Cerdelga®) that may interact with drugs during anaesthesia.

Particular preparation for airway management

There is currently no evidence of specific preparations in these patients.

Particular preparation for transfusion or administration of blood products

Standard preparation for scheduled surgery is advisable. However, in patients with clinical evidence of coagulopathy or those with thrombocytopenia, preoperative measures are to be discussed interdisciplinary with surgeons, anaesthesiologists and patients. In patients with increased risk of bleeding complications, blood products should be prepared.

Particular preparation for anticoagulation

Gaucher disease seems not to be associated with thrombotic events but has some risks for increased bleeding. In patients with clinical evidence of coagulopathy or those with thrombocytopenia, an individualized risk assessment is necessary. If there is an increased risk for perioperative thrombotic events, anticoagulation treatment is indicated as standard of care.

Particular precautions for positioning, transport or mobilisation

Gaucher disease is associated with musculoskeletal deformities that will be evaluated in preoperative assessment. Based on that, individual measures are to be planned. However, there are no specific points to consider in general in these patients based on current evidence.

Probable interaction between anaesthetic agents and patients' long-term medication

Some patients will be treated with specific agents approved for Gaucher disease. Specific caution is necessary in patients receiving eliglustat (Cerdelga®), a drug acting as highly specific inhibitor of enzymes for glucocerebroside syntheses. This substrate-reducing therapy may interfere with perioperative drug therapy. Eliglustat is metabolized strongly by hepatic CYP2D6 – enzymes and to a lesser extent by CYP3A. Thus, all inhibitors of these pathways may increase toxicity of eliglustat and should be avoided. Indeed, not only CYP2D6 inhibitors but also inducers or substrates of may affect metabolism of the drug. For concomitant treatment, data bases for drug interaction may be a source of further information as are clinical pharmacologists.

For perioperative use, this interaction may affect the following drugs (examples):

- 5HT3-antagonists (ondansetron)
- Beta- blockers
- Opioids like codeine and tramadol
- Anti-infectives (rifampicin, erythromycin, voriconazole, posaconazole, clarithromycin, ciprofloxacin etc.)

Interaction with eligustat may cause significant adverse events, with long-QT-syndrome and sequelae like Torsade-de-pointes-tachycardia.

Due to the circulating half-life of eliglustat of 7-9 hours, the drug should be stopped about 48 hours before surgery.

There are no specific anaesthetic implications for patients treated with enzyme replacement therapy.

Anaesthetic procedure

Gaucher disease does not alter standard anaesthetic procedures. In patients with coagulopathy, hemostasis should be optimized preoperatively.

Particular or additional monitoring

Choice of monitoring and additional measures perioperatively should be adapted according to patient's individual conditions.

Possible complications

Perioperative bleeding complications should be anticipated. In patients with concomitant use of eligustat, risk for cardiac events may be increased. In patients with Gaucher disease, there is an increased risk of postoperative infections, thus, antibiotic prophylaxis should be administered.

Post-operative care

Choice of postoperative care should be adapted according to patient's individual conditions. In patients with high risk of bleeding, postoperative pain management should be evaluated choice of drugs used including increased risk related to NSAIDs use.

Information about emergency-like situations / Differential diagnostics

No specific points to consider.

Ambulatory anaesthesia

Choice of ambulatory versus in-hospital care should be adapted according to patient's individual conditions.

Obstetrical anaesthesia

Primary choice of anaesthesia in obstetric surgery and to support birth follow an individual risk assessment. Due to potential interactions with the coagulation system and with physiologic changes in pregnancy, blood test results should be available to assess current status of platelet count and coagulation parameters. There is some evidence in literature, that neuroaxial anaesthesia like epidural anaesthesia or spinal anaesthesia are possible modalities during birth. Perioperative bleeding risk could be increased.

Literature and internet links

1. For general information on Gaucher disease:
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4017182/>
2. For pediatric patients undergoing surgery: <https://www.ncbi.nlm.nih.gov/pubmed/16189337>,
German Guideline 2006 http://www.morbus-gaucher-oegg.at/wp-content/uploads/gen_leitlinien.pdf [German]
3. For obstetric surgery and birth delivery: <https://www.ncbi.nlm.nih.gov/pubmed/15477054>,
<https://www.ncbi.nlm.nih.gov/pubmed/20499804>
4. For Eliglustat therapy: https://www.g-ba.de/downloads/92-975-826/2015-03-30_M4A_Eliglustat.pdf [German] and EPAR of EMEA (<http://www.ema.europa.eu>)
https://ec.europa.eu/health/documents/community-register/2015/20150119130463/anx_130463_de.pdf [GERMAN]

Last date of modification: November 2017

These guidelines have been prepared by:

Author

Sascha Tafelski, Anaesthesiologist, University hospital Campus Virchow Klinikum and
Campus Charité Mitte, Berlin, Germany

Sascha.Tafelski@charite.de

Peer revision 1

Olga Levchenko, Anaesthesiologist, National Research Center for Hematology
Moscow, Russian Federation, Russia

levchenkokp@rambler.ru

Peer revision 2

Jeff Szer AM, Disease Group Lead: Non-malignant haematology, Parkville Integrated
Haematology Service, The Royal Melbourne Hospital, Melbourne, Australia

jeff.szer@mh.org.au
