

ISOSORBIDE

[ARCHIVED MONOGRAPH]

Use

Isosorbide was used intermittently for some years on an experimental basis to control hydrocephalus in infancy in order to prevent or delay the need for shunt surgery.

Pharmacology

Isosorbide is an inert sugar (1,4,3,6-dihydrosorbitol) which acts as an osmotic agent when given intravenously in much the same way as mannitol. It is thought to be capable of reducing the formation of cerebrospinal fluid without inducing an excessive diuresis. Hypernatraemia may occur, especially if the fluid intake is inadequate. Many children dislike the taste (particularly at first). Possible adverse effects (all of which are reversible on stopping the drug) include hypernatraemia, acidosis, weight loss, vomiting and diarrhoea, but local experience suggests that, with the dose recommended here, such problems are uncommon.

Lorber first suggested, in 1981, that isosorbide might delay or abolish the need for shunt surgery in some children with congenital hydrocephalus with or without spina bifida as long as the condition is not deteriorating rapidly and the cerebral mantle is at least 15 mm thick. He also published a preliminary report suggesting that it is of value in at least delaying the need for shunt surgery in children with post haemorrhagic hydrocephalus. No controlled study of its use in the management of such children has yet been published, and the only formal trial of its role in the management of children with spina bifida has concluded that, although it can delay the need for shunt placement for 2–3 months, it makes no clear long-term difference to the number finally requiring shunt placement. Nevertheless, this study was not large enough to rule out some reduction in the number needing surgery and such lasting benefit might arguably be more readily expected in children with acquired post-haemorrhagic hydrocephalus. In the United States oral glycerol, or a combination of acetazolamide (q.v.) with or without furosemide, was rather more widely used in the first-line management of post-haemorrhagic hydrocephalus, until a UK trial has cast serious doubt on the wisdom of such treatment in 2001.

Treatment

The standard starting dose is 8 g/kg per day by mouth given in divided doses every 4–8 hours. The sugar has a slightly bitter after taste and is best given, therefore, with feeds. Lower doses can sometimes be used for maintenance purposes, but doses of up to 12 g/kg per day have been used for a few weeks without side effects. Medication is usually only withdrawn gradually (unless there is a shunt present capable of relieving any acute change in CSF pressure).

Supply

Pharmacies can prepare a solution containing 1 g per ml with a one year shelf life for a basic in-house cost that should not exceed £40 per 100 ml.

References

- Salfield AN, Lorber J, Lonton T. Isosorbide in the management of infantile hydrocephalus. *Arch Dis Child* 1981;**56**:806–7.
- Lorber J, Salfield S, Lonton T. Isosorbide in the management of infantile hydrocephalus. *Dev Med Child Neurol* 1983;**25**:502–11.
- Liptak GS, Gellerstedt ME, Klionsky N. Isosorbide in the medical management of hydrocephalus in children with myelodysplasia. *Dev Med Child Neurol* 1992;**34**:150–4.