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Ifosfamide Induced Neurotoxicity in Soft Tissue Tumours

Kajus Merkevičius[1], Indrė Tamulienė[2], Vilma Rutkauskaitė[2]

[1] Clinic of Pediatrics, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania
[2] Center for Pediatric Oncology and Hematology, Vilnius University Hospital Santaros Klinikos, Vilnius, Lithuania

Background. In pediatric population Ifosfamide (IFO) is a widely used antineoplastic drug. IFO-induced encephalopathy (IIE) develops in 10-40% of adult patients, some studies report incidence up to 10% in children. Renal, liver function, drug interactions are studied as possible risk factors. IIE mostly requires symptomatic treatment, while methylene blue (MB) prophylaxis is investigated [1-3].

Aim. To study IIE in children with soft tissue tumours.

Methods. Retrospective case analysis.

Results. At tertiary centre 3 male patients were treated with IFO, 4 years old (y.o.) had retroperitoneal embryonic rhabdomyosarcoma, while 7 y.o., 8 y.o. had Ewing sarcomas. 7 y.o. presented with the most mild neurotoxicity symptoms (disorientation, agitation) that were present after just 5 IFO doses, on a 2nd day of VIDE (block 2; Ewing 2008 protocol). In contrast, 8 y.o. was treated with the same protocol and had more distinct symptoms: vertigo, disorientation in surroundings, agitation with visual hallucinations after 19 IFO doses on 1st VAI (block 1) day. In both cases IFO was discontinued, in the latter IFO was changed to Cyclophosphamide (CP), the 7 y.o. additionally received MB. In both cases neurological symptoms regressed. The most severe symptoms: vomiting and 10 minute seizure episode (confusion, dextral deviation of head, eyes, tonic contractions of the limbs), were present in the 4 y.o., electroencephalography results were concluded as IIE. Symptoms presented after 11 IFO doses on 1st I^{2}VA (block 6) day. IFO was changed to CP, additionally MB and diazepam were given – neurological symptoms regressed.

Conclusions. At Lithuanian tertiary centre treatment with IFO induced a variety of neurotoxicity symptoms at different treatment stages. A hypothesis that a trend of younger age and later onset of symptoms are related to a more sever neurotoxicity presentation could be raised. Further research on risk factors, prophylaxis, treatment and long-term consequences are needed.

References:

1. Ide Y, et al. Analysis of the clinical characteristics of pediatric patients who experience ifosfamide-induced encephalopathy. Pediatr Blood Cancer. 2019 Dec;66(12):e27996. doi: 10.1002/pbc.27996. Epub 2019 Sep 18.
2. Sarbay H, et al. Ifosfamide induced encephalopathy in a child with osteosarcoma. J Oncol Pharm Pract. 2021 Jul;27(5):1302-1306. doi: 10.1177/1078155220963545. Epub 2020 Oct 6.
3. Vazirian F, et al. Aprepitant, fosaprepitant and risk of ifosfamide-induced neurotoxicity: a systematic review. Cancer Chemother Pharmacol 90, 1–6 (2022). https://doi.org/10.1007/s00280-022-04439-x