

Monitoring of pharmacological treatment of patients with juvenile myoclonus epilepsy

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Background

Patients with juvenile myoclonus epilepsy (JME) may have an uncontrolled seizure situation and challenges regarding adherence to medication. Implementation of therapeutic drug monitoring (TDM) of antiepileptic drugs (AEDs) contributes to individualisation of their therapy. **The purpose of this study was to investigate how the treatment of patients with JME is monitored, with special focus on the use of valproate and implementation of TDM.**

Method

All patients included in a clinical JME-study at Drammen hospital were given a questionnaire regarding adherence of AEDs. Additional data were collected from medical records, and retrospective data from the TDM-database at the National Center for Epilepsy were included. All blood samples were drawn drug-fasting at assumed steady state. The study was approved by the Regional Ethics Committee.

Results and Discussion

- Data from 89 patients with JME, 53/36 women/men aged 14-39 (mean 26) years were included (Tab 1).
- Only 29 (33%) were free from all seizure types. Of the remaining, 19 had generalized tonic-clonic seizures, 60 had myoclonic jerks (Tab 1).
- 75 (84%) used AEDs, 63% monotherapy; valproate (33), lamotrigine (27) and levetiracetam (21) were the most common (Fig 1).
- There was a significant difference in mean dose of valproate given to the male/female users, 1002 vs 773 mg/day ($p < 0.05$, range 150-2400), but not in mean serum concentration 390 vs 378 $\mu\text{mol/l}$ ($n=190$, range 0-777), which is important to consider in women of childbearing age (Fig 2).
- TDM with at least one measurement was seen in 80 patients (1-26 measurements per patient, and 17% (116/680) of the serum concentrations were below the reference ranges. Half of the patients measured serum concentrations more than once a year.
- 61% replied that TDM was of importance to them. 29% reported not to adhere to correct dosage/timing and 13% sometimes/often used AEDs differently than prescribed.

Conclusion

- Monitoring the treatment of patients with JME demonstrated that only one third was seizure free, and AEDs with a need of careful monitoring were commonly used, with special focus on valproate.
- There is extensive pharmacological variability between individuals and even though doses are different, serum concentrations obtained may not correspond.
- Focus on these aspects may contribute to closer monitoring of patients with JME for optimal treatment outcome.

References: Syvertsen et al., 2017, Johannessen Landmark et al., 2017, 18

Table 1.

Patient characteristics	
Patients	
Number of patients	89 (53/36)
Mean age (range)	26 (14-39)
Age of epilepsy onset (range)	14,5 (6-23)
Current use of AEDs	
0 AEDs (%)	14 (16)
1 AED (%)	56 (63)
2 AEDs (%)	17 (19)
3 AEDs (%)	2 (2)
Current seizure status	
Patients free of all seizure types (%)	29 (33)
Patients with generalized tonic clonic seizures (%)	19 (21)
Patients with myoclonic jerks (%)	60 (67)

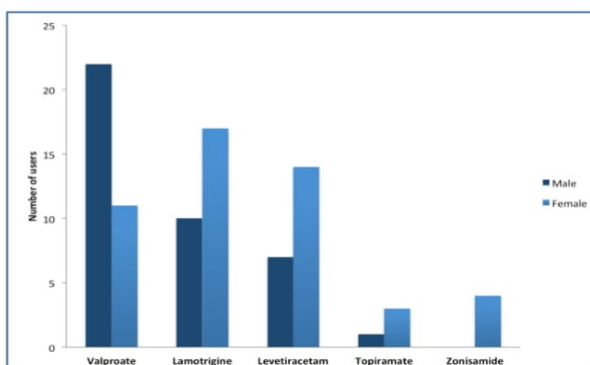


Figure 1. Users of AEDs by gender; there were less than three users of clobazam, ethosuximide, brivaracetam, perampampanel and lacosamide.

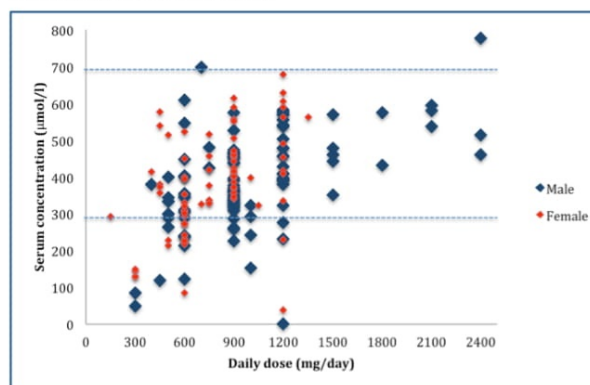


Figure 2. Pharmacokinetic variability in male/female users of valproate. The reference range is marked with dotted lines.

