Poster

[P26-4] P26-4: Central nervous system drugs (3)

Chair: Christoph Hiemke, Germany

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[P26-4-4] Should older patients have lower serum lithium therapeutic ranges?

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Background

Lithium has been used in the treatment of bipolar disorder for many years. Due to its narrow therapeutic index, close monitoring of serum lithium-levels is warranted. Undesirable side effects and toxicity from lithium lead to tremor, drowsiness, slurred speech and confusion. In severe toxicity, death can occur as a consequence of neurologic and cardiovascular complications. Some literature suggests inclusion of specific lower therapeutic ranges in older patients, thereby accounting for increased sensitivity to adverse effects, particularly neurotoxicity. However, there is an overall lack of specific recommendations for clinical practice guidelines, and little of it is informed by specific research evidence.

Methods

In order to assess the current status of lithium therapeutic drug monitoring (TDM) testing in our hospital, a retrospective analysis of laboratory data was conducted. Consecutive serum lithium test results performed between January 1, 2015 and December 31, 2016 were included in the analysis. Additional information, including patient age at time of testing, serum levels of creatinine, and urea, lithium dose, and time of the last dose, were also collected and analyzed. SPSS v24.0 (SPSS Inc., Chicago IL) and GraphPad Prism 5 (GraphPad Software Inc., San Diego CA) software packages were used for data analysis.

Results

The serum lithium levels for three age groups were compared: children (14 to 18 year old), younger adults (19 to 64) and older adults (65 and older). The average serum lithium concentrations (SD, n) were 0.76 (0.32, 70), 0.72 (0.32, 949) and 0.55 mmol/L (0.29, 382), respectively ($p < 0.001$, ANOVA). Lithium levels were significantly correlated with creatinine and urea levels ($p < 0.001$, Pearson Correlation).The test frequency, assessed by number of lithium measurements per patient during this two-year period, did not show significant differences between the age groups ($p = 0.294$, ANOVA).

Conclusions

The average of serum lithium levels in older patients is significantly lower than the younger patients. For patient safety and to avoid lithium induced side effects and toxicity, a cautionary comment should be reported to accompany with the lithium results for older patients. Further studies to establish the optimal therapeutic ranges in older patient populations are needed.