COMPARATIVE ANALYSIS OF TWO PHARMACOKINETIC PROGRAMS FOR LITHIUM ADJUSTMENT

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BACKGROUND

The narrow therapeutic window of lithium (**0.6 - 0.8 mmol/L**) requires accurate monitoring of its serum concentrations to achieve a safe and effective therapy.

AIM AND OBJECTIVES

To compare two pharmacokinetic programs and analyze the precision and accuracy of lithium serum concentration adjustment.

MATERIALS AND METHODS

- Retrospective observational study
- Secondary care hospital
- Jan 2020 - Dec 2020
- Electronic medical records
- Sheiner and Beal's prediction error theory
- T-test for comparing means

Included patients	admitted with at least one determination of serum lithium concentration.
Variables analysed	dosage, serum concentrations, date of blood analysis, serum creatinine, renal function, date of birth, sex and weight.
Serum estimations	PKS® vs MwPharm++®
Accuracy	mean prediction error (**MPE**).
Precision	mean absolute prediction error (**MAPE**) and the square root of the root mean square prediction error (**RMSE**).

RESULTS

79 levels from 18 patients (55.6% male). Median determinations per patient were 3 [IQI 2-4.5].
Median age 52.4 years [IQI: 41.7-55.4], median weight 70.5 kg [IQI: 66.8-82.15].
Three patients (16.7%) had a creatinine clearance < 60 ml/min.

PKS®

MPE = -0.02 (-0.064-0.024)

MAPE = 0.12 (0.08-0.16)

RMSE = 0.20

p=0.22

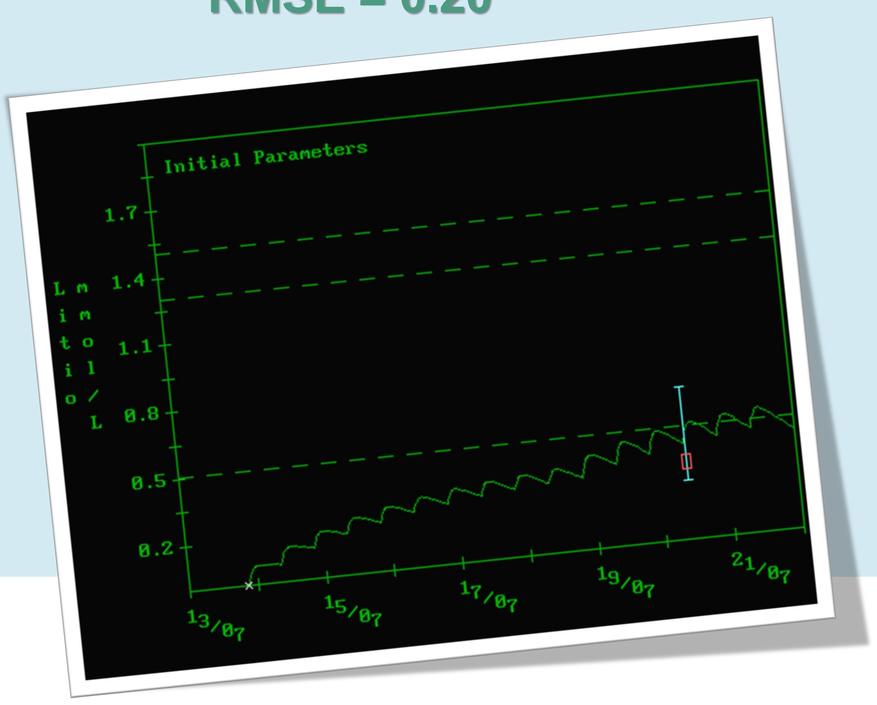
p=0.40

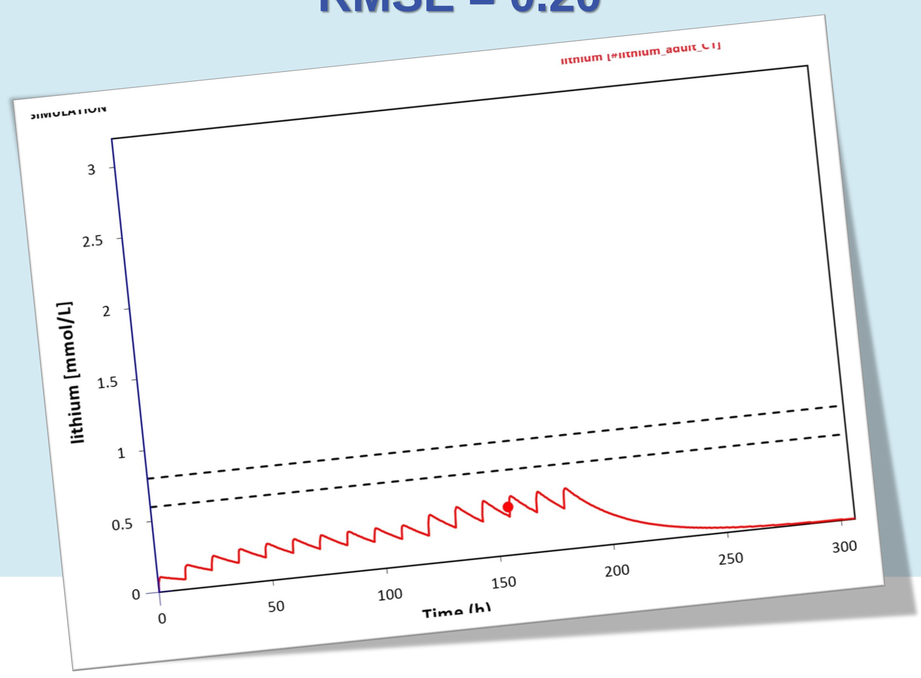
MwPharm++®

MPE = 0.02 (-0.025-0.065)

MAPE = 0.14 (0.11-0.18)

RMSE = 0.20





CONCLUSIONS

- ❑ MwPharm++ and PKS showed **satisfactory predictive capabilities**, with **no significant statistical differences.**
- ❑ Both programs proved to be **valid options for lithium pharmacokinetic monitoring** in clinical practice.
- ❑ Larger studies are needed for confirmation.

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4CPS-001

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