UNIVERSITY OF LATVIA

79th International Scientific Conference of the University of Latvia

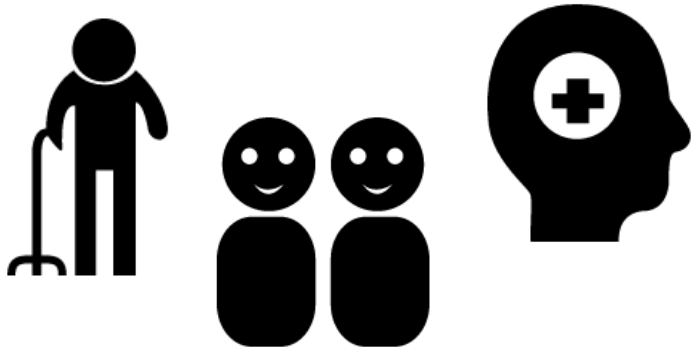
Evaluation of the usefulness of computer microtomography for the analysis of subdivided prolonged release tablets containing carbamazepine

Meisner Michał[1], *Sarecka-Hujar Beata*[1], *Duda Piotr*[2], *Wilczyński Sławomir*[1]

[1] *Medical University of Silesia, Faculty of Pharmaceutical Sciences in Sosnowiec, Department of Basic Biomedical Science, , Katowice, Poland*

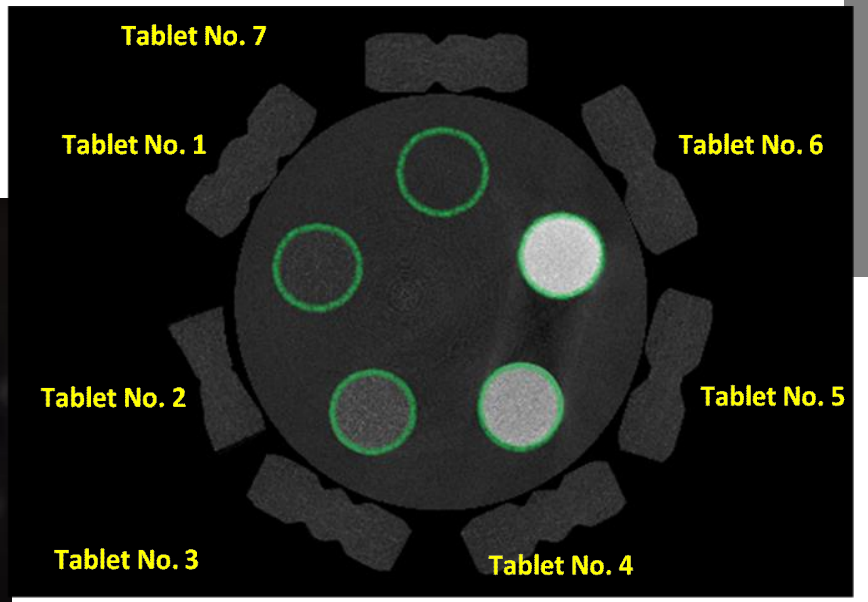
[2] *University of Silesia, Faculty of Computer Science and Materials Science, Department of Biomedical Computer Systems, Institute of Computer Science, Poland*

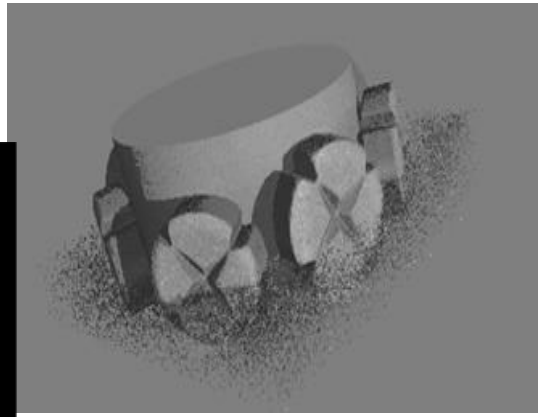
Can the tablet splitting be useful?



- The study was conducted on Finlepisn 200 retard, tablets containing carbamazepine.
- All tablets were carefully measured and weighted.
- A kitchen knife was used for the division.
- In the analysis, the correlation between brightness of scans of the tablets obtained with the Phoenix vltomelx Microtomograph (GE, Germany) and density was used.

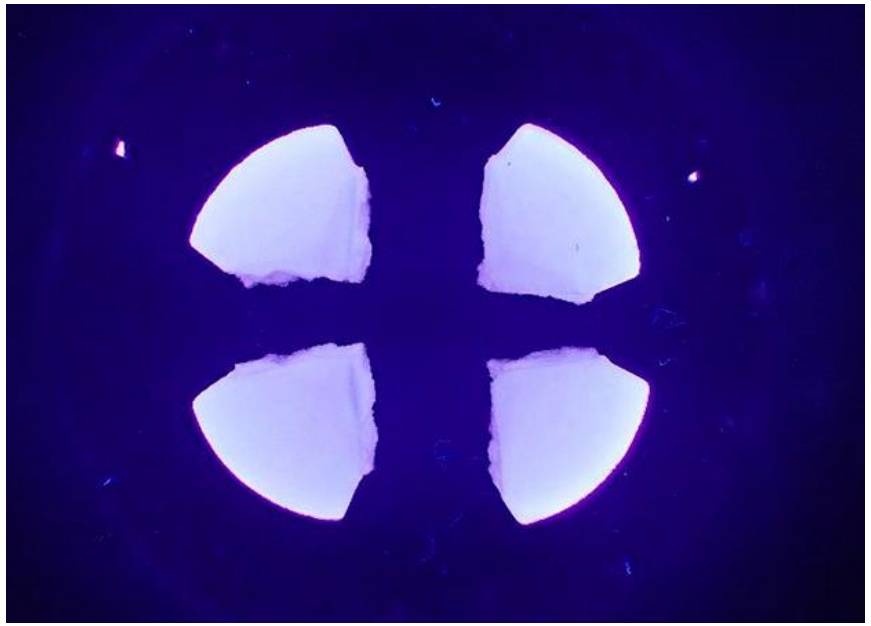
AIM:
To assess the usefulness of the x-ray computer microtomography in the analysis of ingredients' distribution in prolonged release tablets containing 200 mg of carbamazepine.





Results

- All tested tablets met the requirements set by the Polish Pharmacopoeia.
- After splitting into two parts, the weight loss for 2 of the tablets exceeded 3%. However, when divided into 4 parts, 4 of the tested tablets did not meet the requirements.
- The analysis of the homogeneity of the weights demonstrated that both, whole tablets and tablets divided into 2 parts, met the requirements set for them.*
- The weights of the individual tablet parts were also compared with the corresponding theoretical weights obtained as a result of the ideal division. There was a statistically significant difference between the weights of the left halves and only one of the quarters.

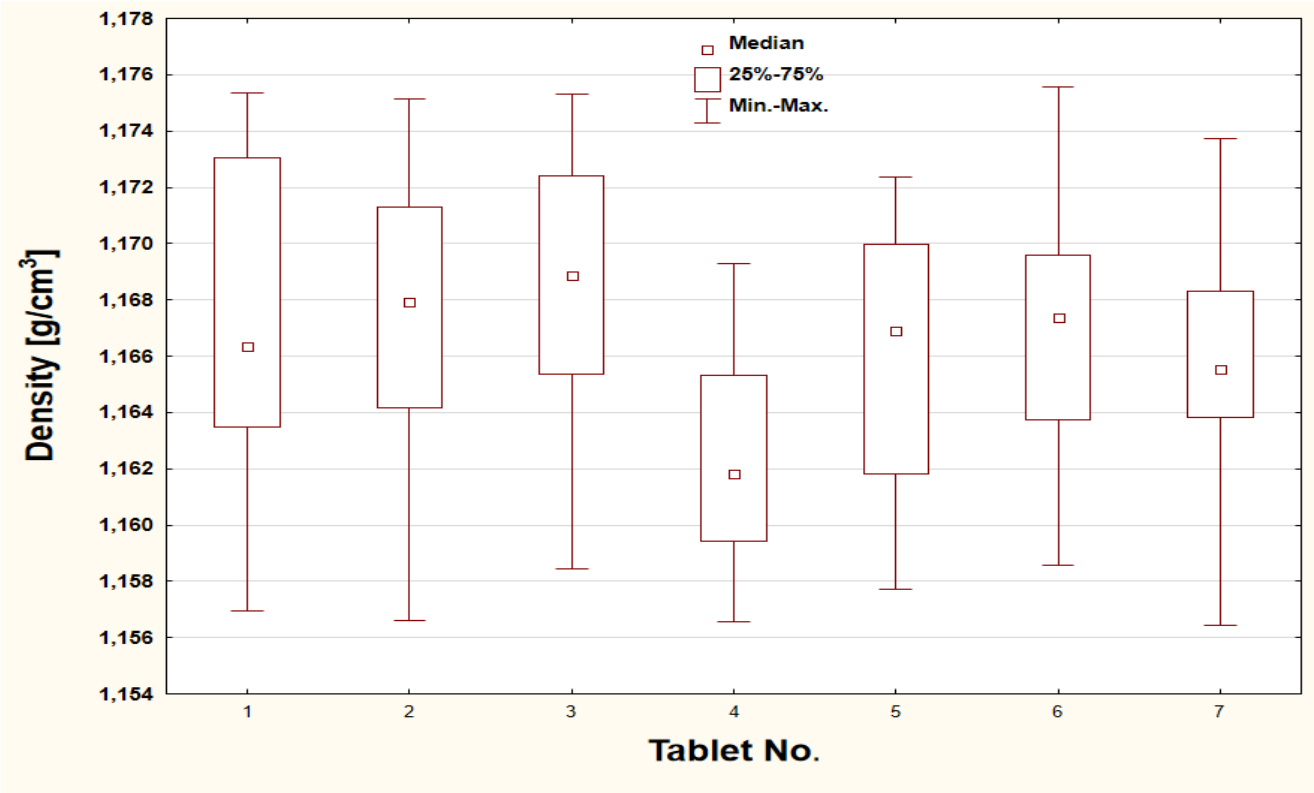


* For whole tablets, the range of 95% -105% of the average weight of the tablets was adopted, while for those divided into 2 parts, two criteria were determined: the first one was that no more than one part of the tablet may exceed the range of 85-115% of the average weight of a half tablet, and second, that no part of the tablet can exceed the range of 75% -125% of the average weight of the tablet half.

Microtomographic analysis

- A statistically significant difference in density between the whole tested tablets was observed (Fig. 1)

Figure 1. Box plots for density comparison between whole tablets



- No statistically significant difference was found for brightness of pixels between the tablet halves (Fig. 2)

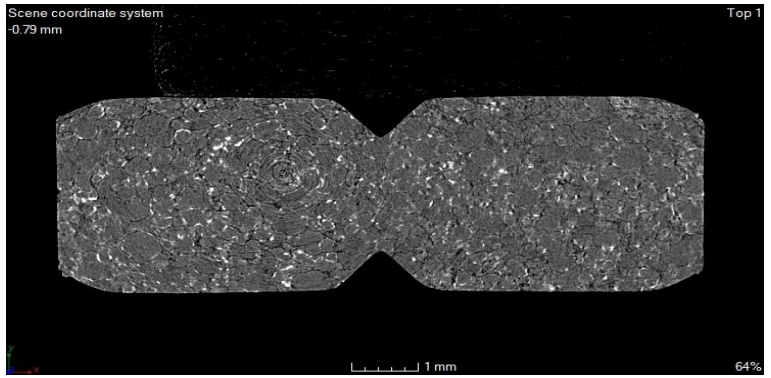
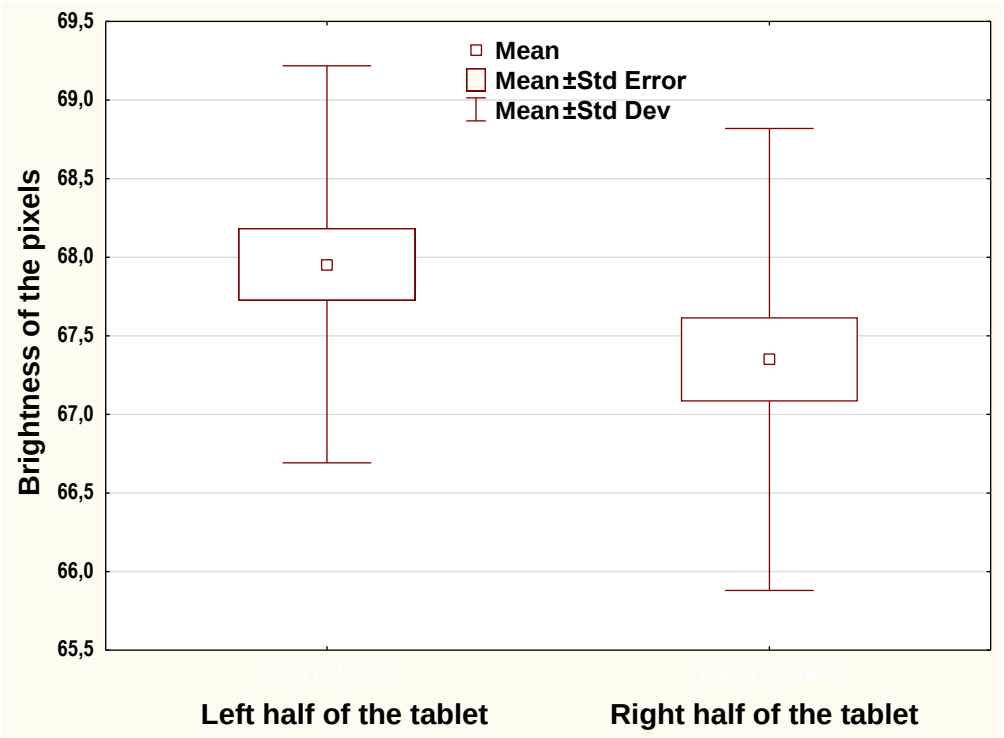


Figure 2. Box plots for brightness of pixels comparison between halves of tablets



Conclusions

- Microtomographic methods followed by picture analysis enable the assessment of the homogeneity of the ingredients' distribution in carbamazepine-containing tablets.
- Subdivision of the carbamazepine-containing tablets showed a homogeneous distribution of the ingredients in tablets halves.
- There were differences between the theoretical and actual weights of the divided tablet parts, which may result in incorrect dosing by the patient.