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The characterisation of Methadone hydrochloride crystals using confocal microscope with Rhodamine staining**Noor Al-Hasani, Paul G Royall, Neil Rayment and Kim Wolff**
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Statement of the Problem: There is a lack of current data about the crystalline structure of methadone hydrochloride (MDN), which may be an effective tool for MDN characterisation in forensic science. Older data is attributed to the sole use of light microscopy (LM), which is incapable of analysing 3D objects. The purpose of this study is to develop a new microscopic technique, using the confocal microscope (CM), to harness MDN characterisation and verify the possibility of staining MDN crystals with Rhodamine dye so that the detection and measurement of MDN crystalline dimensions can be standardised.

Methodology & Theoretical Orientation: MDN saturated solution (26 mg/200 μ L) was prepared, and MDN was crystallised using (0.0001% g/mL) rhodamine solution as a crystallising solvent. Seven slides were prepared and 6 crystals were observed from each slide ($n = 42$) using CM with a magnification of X40 at excitation level of 543 nm. Dimensions were measured using Z-stacks and confocal images were projected by image J software (1.50i/ national institute of health USA).

Findings: Diamond shaped MDN crystals were observed stained red. The mean length (\pm standard deviation) of the MDN crystals was $32 \pm 8.3 \mu\text{m}$; the mean width $20.9 \pm 5.5 \mu\text{m}$ and the thickness was $9.6 \pm 4.6 \mu\text{m}$. The greatest variation was observed in the crystals length (range $13.5 \mu\text{m} - 52.5 \mu\text{m}$), while inconsistency was also observed for thickness (range $4.2 \mu\text{m} - 24.4 \mu\text{m}$).

Conclusion & Significance: The confocal microscope successfully identified diamond-shaped MDN crystals, although some inconsistency in the dimensions measured was observed between the 42 crystals. This technique shows potential for the characterisation methadone hydrochloride identification in forensic science.

Biography

Noor Al-Hasani. I finished my Bachelor degree in Pharmacy at Bagdad College of Pharmacy in 2006, Iraq. After 3 years of working as a Pharmacist at different hospitals in Iraq, I started studies for a master degree in clinical pharmacy from Baghdad University/College of Pharmacy in 2011. I was assigned in November 2011 as Assistant Lecturer at University of Bagdad / College of Dentistry, teaching pharmacology for undergraduate students. In October 2014, I joined a PhD programme at King's College London working with Prof Kim Wolff and Dr. Paul G Royall to design a new abuse- deterring formulation of methadone hydrochloride.

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