FORMULATION AND CHARACTERIZATION OF A PAEDIATRIC NANOSUSPENSION OF PRAZIQUANTEL

Siziwe Bebe

University of Zimbabwe, Chemical Engineering, Harare, Zimbabwe
E-mail: sizi.bebe@gmail.com

ABSTRACT

Nanosuspensions pose as an alternative dosage form for poorly soluble BSC class II drugs. They have been used to improve the pharmaceutical properties such as bioavailability, solubility and plasma circulation time of drugs leading to reduction in dose administered. Considering these characteristics, they can be employed to improve schistosomiasis therapy in peadiatrics. Praziquantel (PZQ) is the drug of choice in the treatment of schistosomiasis with no alternative dosage form available that is suitable for peadiatrics. Recommendations from previous studies show that paediatrics are also infected with schistosomiasis and they need to be included in treatment. In this study a nanosuspension of PZQ was formulated and characterized. Praziquantel nanosuspension was prepared by precipitation-ultrasonication method using the convetional PZQ drug that is used. The nanosuspension was characterized for particle size and width of particle size distribution, zeta potential, in vitro drug release at pH 7.4 and physical stability.

Blank nanosuspension formulation showed a bimodal distribution with peaks at 708.6 nm and 5.47 µm. Praziquantel nanosuspension showed a normal distribution with a peak at 4.98 µm and a zeta potential of -10.8 mV. The polydispersity index of PZQ nanosuspension was 0.623. The in-vitro release profile showed a slow release of PZQ nanosuspension with about 20% released over 60 minutes as compared to 60% over the same time for the free drug. The accelerated stability tests showed a particle size of 4.988 µm and 4.993 µm in sample stored at 4 °C and 25 °C respectively over 4 weeks showing great stability. The zeta potentials were -7.71 and -7.67 respectively. Praziquantel was successfully fabricated into a nanosuspension exhibiting controlled release patterns which if proved safe, can alleviate drug intolerance and resistance. The physical stability was similar at different storage conditions.

Keywords: Paediatric, Nanosuspension, Praziquantel, Slow release