P0276
Poster Session I
Antibiotic interactions, formulations and administration

STABILITY OF DIFFERENT BRANDS OF MEROPENEM RECONSTITUTED IN ISOTONIC SALINE

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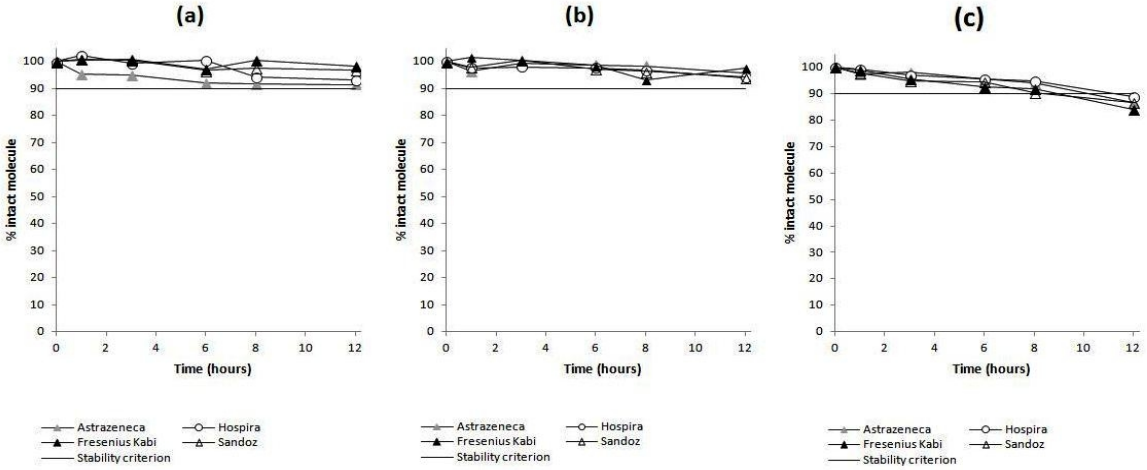

FIG. 1 : Stability over time for the 4 tested brands of meropenem in 3 different concentrations. (a) Percentage of intact molecule over time for the 4 commercially available vials of meropenem in a concentration of 10 mg/mL. (b) Percentage of intact molecule over time for the 4 commercially available vials of meropenem in a concentration of 20 mg/mL. (c) Percentage of intact molecule over time for the 4 commercially available vials of meropenem in a concentration of 40 mg/mL.

Purpose :

The poor stability of meropenem has been reported repeatedly when using concentrated solutions at room temperature or at elevated temperatures (≥37°C), which is why continuous infusion has been considered an unacceptable choice for delivery of meropenem. However, storage at lower temperature or using less concentrated solutions may be a way to overcome this limitation and may be a viable alternative to administer meropenem as a continuous infusion. Currently all available data have been derived from tests on the original product from Astrazeneca, and it is unsure if these data can be extrapolated to the stability of other commercially available vials. Therefore, the aim of this study was to investigate whether the stability of 4 worldwide commercially available vials of meropenem are equally stable.

Methods :
Commercially available meropenem vials were reconstituted and mixed with 0.9 % sodium chloride to produce solutions with concentrations of 10,20 and 40 mg/mL in polypropylene syringes, which were kept at 25°C. Samples were taken immediately after preparation and up to 12 hours and were stored at-80°C until assay. Meropenem concentrations were determined using a high performance liquid chromatography coupled to tandem mass spectrometry operating in the multiple reaction monitoring mode. Drug potency was determined at each sampling time as the percentage of the initial meropenem concentration remaining. The solution was considered stable if the percentage of intact meropenem was ≥ 90%.

Results :

After 12 hours storage at room temperature, all tested brands attained the stability criterion of 90 % intact molecule when meropenem was dissolved as a 10 or 20 mg/mL solution in 0.9% sodium chloride. However, when higher concentrations were used, stability decreased and fell below 90% after 8 hours storage at room temperature, as the percentage intact molecule after 12 hours was 86.5 %. The results are shown in figures 1 a-c which show the percentage of intact molecule for all tested brands over time for 10, 20 and 40 mg/mL. Throughout sampling, solutions were clear and ranged from colorless to slightly yellow. Stability of the different vials of meropenem was comparable for the time period tested (related samples Friedman's two way of analysis of variance by ranks, p=0.282).

Conclusion :
All tested commercially available vials of meropenem in a concentration of 10 and 20 mg/mL were stable for 12 hours at 25°C when diluted in 0.9% sodium chloride. The 40 mg/mL solutions were stable for a maximum of 8 hours. Clinicians can safely use these generic forms of meropenem as 8-hour infusions if the concentration is ≤ 40 mg/mL and dissolved in 0.9 % sodium chloride. This report is the first to show equivalent stability between different commercially available vials of meropenem.