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TITLE

EFFECT OF REPLICATE DESIGN ON DRUG VARIABILITY AND BIOEQUIVALENCE IN HUMANS

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The purpose of this study is to investigate the effect of using replicate design on the intra/inter subject variability and bioequivalence of drugs in healthy volunteers. Model drugs used for analysis were amoxicillin/clavulanic acid combination. 24 healthy subjects participated in this study using 4-phase replicate crossover design. Individual disposition kinetic parameters of areas under plasma concentrations (AUC0-t) and maximum concentration (Cmax) were calculated by non-compartmental analysis using Kinetica® program V 4.2 using all phases. The 90 % confidence intervals for log-transformed AUC0 -t and Cmax were calculated for phases I & II; then for phases I, II and III; and for phases I, II, III and IV respectively. The intra and inter-subject variability values did not show a trend to decrease by the increase in phases included in analysis in both drugs and for both parameters. In addition, the 90 % confidence intervals for log-transformed AUC0 –t and Cmax passed the 80-125 % limit range in both drugs for all phase combinations, even though Cmax variability was shown high for clavulanic acid. However, individual bioequivalence was shown for AUC and not shown for Cmax of both drugs. These results are not supportive for the use of replicate design as an approach to show the high inter/intra subject variability of highly variable drugs and hence justifying wider acceptance limits of 75-133 % as recommended by the draft EMEA guideline. Literature information about drug high variability should be sufficient to justify using wider acceptance limits of 75-133 %.