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PHARMACOKINETICS OF ^{125}I-LABELLED IgG, F(ab′)$_2$ AND Fab FRACTIONS OF SCORPION AND SNAKE ANTIVENINS: MERITS AND POTENTIAL FOR THERAPEUTIC USE

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M. Ismail and M. A. Abd-Elsalam. Pharmacokinetics of ^{125}I-labelled IgG, F(ab′)$_2$ and Fab fractions of scorpion and snake antivenins: merits and potential for therapeutic use. *Toxicon* **36**, 1523–1528, 1998.—The immunoglobulin fractions IgG, F(ab′)$_2$ and Fab of scorpion and snake antivenoms possess pharmacokinetic characteristics that are significantly different from their respective venoms. The venoms (and their toxins) are several fold faster in their distribution into the tissues than any of the immunoglobulin fraction. In rabbits, F(ab′)$_2$ possessed the fastest disposition rate constants and the longest distribution half lives. In the physiologically based pharmacokinetic experiments carried out in mice F(ab′)$_2$ possessed the highest Cp_{max}, smallest AUC and the shortest $t_{1/2}\beta$ in the different tissues while Fab had values in between IgG and F(ab′)$_2$. Rescue experiments in anaesthetized rats challenged with lethal doses of venoms or toxins and infused with border-line neutralizing doses of antivenoms, showed that rats infused with F(ab′)$_2$ completely recovered, those infused with IgG partially rescued and none of the rats infused with Fab survived. It is concluded that F(ab′)$_2$ of scorpion and snake antivenoms possess pharmacokinetic characteristics that render it the most suitable for use in serotherapy of scorpion and snake envenoming.

INTRODUCTION

The success of serotherapy of envenoming depends on the potency of the antivenom used (titre, spectrum of activity, etc.), its route of administration (i.v. vs other routes), time elapsed between the bite or sting and antivenom administration, dose administered and the pharmacokinetic characteristics of the immunoglobulin components of the antivenom (WHO, 1981; Theakston and Reid, 1983; Ismail *et al.*, 1980, 1983, 1992, 1997; Ismail and Abd-Elsalam, 1996).

Bites by the black desert cobra (*Walterinnesia aegyptia*) and the mole viper (*Atractaspis microlepidota engaddensis*) were characterized by very rapid death, sometimes before

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