Scopus

Document details

Back to results | 1 of 1

Export Download Print E-mail Save to PDF Add to List More...

Full Text View at Publisher

Toxins
Volume 6, Issue 3, March 2014, Pages 1036-1048

Open Access

In-vitro neurotoxicity of two Malaysian krait species (Bungarus candidus and Bungarus fasciatus) venoms: Neutralization by monovalent and polyvalent antivenoms from Thailand (Article)

Ahmad Rusmili, M.R.[abc], Yee, T.T.[b], Mustafa, M.R.[d], Othman, I.[b], Hodgson, W.C.[a]

[a]Monash Venom Group, Department of Pharmacology, Clayton, VIC 3168, Australia
[b]Jeffrey Cheah School of Medicine and Health Sciences, Monash University Sunway Campus, Bandar Sunway 46150, Malaysia
[c]Department of Basic Medical Sciences, Kulliyyah of Pharmacy, International Islamic University Malaysia, Bandar Indera Mahkota 23800, Malaysia

View additional affiliations

Abstract

View references (39)

Bungarus candidus and Bungarus fasciatus are two species of krait found in Southeast Asia. Envenoming by these snakes is often characterized by neurotoxicity and, without treatment, causes considerable morbidity and mortality. In this study, the in vitro neurotoxicity of each species, and the effectiveness of two monovalent antivenoms and a polyvalent antivenom, against the neurotoxic effects of the venoms, were examined in a skeletal muscle preparation. Both venoms caused concentration-dependent inhibition of indirect twitches, and attenuated responses to exogenous nicotinic receptor agonists, in the chick biventer preparation, with B. candidus venom being more potent than B. fasciatus venom. SDS-PAGE and western blot analysis indicated different profiles between the venoms. Despite these differences, most proteins bands were recognized by all three antivenoms. Antivenom, added prior to the venoms, attenuated the neurotoxic effect of the venoms. Interestingly, the respective monovalent antivenoms did not neutralize the effects of the venom from the other Bungarus species indicating a relative absence of cross-neutralization. Addition of a high concentration of polyvalent antivenom, at the t_{90} time point after addition of venom, partially reversed the neurotoxicity of B. fasciatus venom but not B. candidus venom. The monovalent antivenoms had no significant effect when added at the t_{90} time point. This study showed that B. candidus and B. fasciatus venoms display marked in vitro neurotoxicity in the chick biventer preparation and administration of antivenoms at high dose is necessary to prevent or reverse neurotoxicity. © 2014 by the authors; licensee MDPI, Basel, Switzerland.

Author keywords

Antivenom Bungarus candidus Bungarus fasciatus Krait Neurotoxicity Snake Venom

Indexed keywords

EMTREE drug terms: Antivenom snake venom unclassified drug

EMTREE medical terms: animal experiment animal tissue article electrostimulation male neurotoxicity nonhuman polyacrylamide gel electrophoresis protein determination Western blotting

MeSH: Animals Antivenins Bungarus Chickens Elapid Venoms Male Muscle, Skeletal Neurotoxins