The Clinical Manifestations and Mechanisms of Malayan Pit Viper (MPV) Envenomation

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Introduction

Calloselasma rhodostoma (Malayan pit viper) is a hematotoxic snake distributed throughout Southeast Asia and is one of the most common snake bites in Thailand. Although death is not common, its venom can cause irreversible morbidity resulting from local necrosis and decoagulation.

Objective

This study aimed to collect and review information regarding the clinical manifestations and mechanisms of Calloselasma rhodostoma envenomation.

Method

We conducted a systematic review following the PRISMA guidelines 2020. The PubMed and Scopus databases were searched until 25 October 2022. Articles were screened at the title, abstract and full-text phases.

Result

We identified 185 studies via the electronic database, of which 31 were included in the review. According to the review, the majority of the patients were male (64%) and were bitten at lower limbs (70%). The main protein constituents of the venom are Snake venom metalloproteinases (SVMP) including kistomin and rhodostoxin, C-type lectins (snaclec), Snake venom serine protease (SVSP), L-amino acid oxidase, Phospholipase A2 and Cysteine-rich secretory protein. Each of these affects the body both locally and systemically. Local effects, including swelling, pain, and tissue necrosis, exhibited in approximately 95% of the group, while the percentage of systemic effects, generally detected by impairment of blood coagulation resulting from attacks in various stages of the coagulation pathway, varies from 33% to 88%. Hemolysis was also witnessed.

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Conclusion
The review indicates that MPV envenomation leads to local effects and systemic effects via disrupting different stages in the coagulation cascades as well as necrosis. However, the review implies that venom with thrombin-like mechanisms like MVPs would not be effective in treating thrombotic disorders. Thus, future studies should focus on alternative pathways instead.

Keywords:
Malayan pit viper, snake venom, coagulopathy, local effect, enzymatic activity