

Original Article

Neutralization effects of Iranian *Vipera lebetina* biological properties by Razi institute antivenom

R. Seyedian^{1*}, SM. Hosseini¹, N.Seyyedian², S. Gharibi¹, N. Sepahy¹,
S. Naserinejad¹, S. Ghodrati¹, M. Bahtouee³, HR. Alizadeh Otaghvar⁴,
A. Zare Mirak Abadi⁵

¹The Persian Gulf Marine Biotechnology Research Center, The Persian Gulf Biomedical Research Center, Bushehr University of Medical Sciences, Bushehr, IRAN

²Department of Public Health, School of Health, Tehran University of Medical Sciences, Tehran, IRAN

³Department of Internal Diseases, Fatemeh Zahra Hospital, Bushehr, IRAN

⁴Department of Surgery, Fatemeh Zahra Hospital, Bushehr, IRAN

⁵Department of Venomous Animals and Antivenom Production, Razi Vaccine and Serum Research Institute, Karaj, IRAN

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Abstract

Background: The hemotoxic and neurotoxic factors of snake venoms is the main responsible for necrosis and tissue sloughing. Envenomations are common in rural areas in all provinces of Iran caused by snake species which causes local swelling, ecchymosis and alterations in blood profile in case of hemotoxic venom. In this study some in vivo and in vitro properties (Hemorrhagic, edematogenic and coagulant) of Iranian *Vipera lebetina* venom in addition to neutralizing capacity of pepsin derived Razi Institute polyvalent antivenin were assayed.

Material and Methods: Escalating doses of *Vipera lebetina* venom dissolved in Normal saline (2.5-50 µg/ml) were injected (100µl) subcutaneously to dorsal area of rats (n=3) to investigate mean hemorrhagic amount after 24 hours. Groups of three mice were injected subcutaneously in the right foodpad with various amounts of venom (10-150µg). The left foodpad received the same amount (100µl) of normal saline alone (negative control) to evaluate the edematogenic property of this venom. To determine the coagulant activity, various amounts of venom dissolved in normal saline (50µl) were added to human plasma (200µl) and coagulation time was measured. Razi Institute antivenom was used for neutralization of all three measured biological parameters.

Results: Mean hemorrhagic, procoagulant and edematous amounts (increasing 30% in hind paw edema) were 8.5, 1.1 and 70 microgram, respectively. Preincubation with polyvalent antibody (30 and 200 microliter) decreased hemorrhagic and procoagulant activity. Edematogenic property of this venom decreased significantly by incubation with antivenom (78% to 38% by incubation with 1000 microliter of polyvalent antivenom). Intra peritoneal injection of this remedy following envenomation had no effect in relieving symptoms. Myonecrotic effects were seen by intramuscular injection of *Vipera lebetina* venom in rats.

Conclusion: Our study shows that Iranian antivenom could neutralize some in vivo and in vitro hazardous effects of envenomation by this snake like hemorrhagic, edematogenic and procoagulant properties that paves the way for separation and purification of multiple enzymes present in this venom to investigate the neutralizing capacity from Razi Institute polyvalent antivenom.

Keywords: venom, *Vipera lebetina*, Razi institute antivenom, Iran

*Address for correspondence: The Persian Gulf Marine Biotechnology Research Center, The Persian Gulf Biomedical Research Center, Bushehr University of Medical Sciences, Bushehr, IRAN; E-mail: r.seyedian@bpums.ac.ir