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Effectiveness of a Clinical Protocol Implemented to Standardize the Snakebite Management in Iran: Results of an Interventional Study

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Abstract

Objectives: To evaluate the effectiveness of a new clinical protocol implemented in 2012 to standardize snakebite management in Iran. [1]

Methods:
Design and setting. Prospective interventional study on snakebite victims admitted to Mashhad Toxicology Centre, Imam Reza Hospital.

Patients. Twenty-seven patients treated according to the protocol between April 1, 2012 and October 30, 2012 (P+) were compared with 22 patients who received treatment that did not adhere to the protocol in the year prior to the implementation of the protocol (P-).[2] Demographic characteristics and clinical manifestations as well as treatment details were collected for all patients. At presentation, the severity of envenomation was assessed according to snakebite severity score (SSS). [3]

Statistical Analysis. In order to compare the means of a normally distributed dependent variable in two independent groups, independent samples t-test, and for a non-normally distributed dependent variable, Mann–Whitney U-test was used. For comparing proportions in two groups, chi-square test was used. P-values of less than 0.05 were considered as statistically significant.

Results: Mean (SD) age of patients in the P+ group was 34.8 (18.1) and in the P- group was 35.5 (17.4) which was not significantly different from each other (P=0.894). After implementation of the protocol, a smaller percentage of patients received antivenom as part of their treatment (77% vs 95%, P=0.076). In addition, smaller proportion of patients experienced recurrence of venom-induced effects (18.5% vs 36%, P=0.159). None of patients in both groups required ICU admission. No significant difference in the progression of edema, the development of coagulopathy and the occurrence of allergic reactions was observed between the two groups. Despite no significant difference in the SSS between the two groups (P=0.801), the P+ group received significantly fewer vials of antivenom (8.4 (6.8) vs 12.1 (5.6) vials, P=0.048) and experienced a significantly shorter length of hospital stay (2.2 (1.5) vs 3.2 (1.8) days, P=0.027). As the cost of one-day hospital stay is 50$ and production of each vial of antivenom (Razi™ antivenin) is 10$, the implementation of protocol resulted in approximately 90$/patient healthcare cost savings.

Conclusions: Use of the protocol has led to lower morbidities and decreased healthcare costs. A standardized protocol can improve outcomes, reduce major variations in practice and diminish

unnecessary administration of antivenom. The designing of a region-specific multidisciplinary protocol for snakebite management based on medical capacity of each country is recommended.

Keywords: Snake bite, Iran, Antivenins, Clinical protocol

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