Iranian Red Crescent Medical Journal

LETTER TO EDITOR

Comparison of Vasopressin Versus Epinephrine Effects in Survival of Patients with Asystole: A Double-Blinded Randomized Clinical Trial Study

D Farsi [1*], J Moghimi [1], P Hafezimoghadam [1], MA Zare [1], M Torabi [1]

[1] Department of Emergency Medicine, Hazrat-e-Rasool Akram Hospital, Tehran University of Medical Sciences,Tehran, IR Iran

Please cite this paper as:
Farsi D, Moghimi J, Hafezimoghadam P, Zare MA, Torabi M. Comparison of Vasopressin Versus Epinephrine Effects in Survival of Patients With Asystole: A Double-blinded Randomized Clinical Trial Study. *Iran Red Crescent Med J*. 2011;**13**(8):592-3.

Dear editor,

Cardiovascular-related diseases are the most common causes of cardiac arrest in the adult population (1). The reported survival of this serious condition is 2 % to 24 %, despite rigorous attempts during cardiopulmonary resuscitation (2) Because of the poor clinical yield with epinephrine, (3) studies have focused on possible alternative pharmacological agents. Vasopressin was considered a remedy, based on observations of the implied high concentration of this endogenous vasopressin during cardiac arrest (4, 5). Several clinical trials were also performed in various settings with supportive and contradictory results (6-8). Considering the differences in previous studies that could have arisen from clinical expertise, out-of-hospital management, and other background problems, this double-blind, randomized, controlled trial aimed to assess outcomes, such as return of spontaneous circulation (ROSC); survival at 1 hr, 1 day, and 1 month; and mean survival time, only in asystole patients, who were treated with either vasopressin or epinephrine. Our study was performed in the emergency department (ED) of a large teaching hospital, affiliated with Tehran University of Medical Sciences (TUMS). After confirming asystole in 2 of 3 limb leads during cardiac monitoring, the patients were assigned to receive vasopressin (intervention group) or epinephrine (controll group) by block randomization. Individuals who were pregnant, were aged less than 8 years, had do-not-resuscitate orders or conditions, had resuscitation delayed by more than 20 minutes after cardiac arrest, and had hemorrhagic shock were excluded from the study. Twenty-five patients were assigned to each group. Sixty-two patients were eligible for the study, but 7 were trauma victims and in hemorrhagic shock and were therefore excluded. Four of 62 patients had end-stage malignancies, and resuscitation efforts were not started. One patient was excluded from the study due to a delay at the beginning of resuscitation of more than 20 minutes. Ultimately, 50 patients enrolled in the study by convenience sampling. Recommended doses of epinephrine (1 mg IV) or vasopressin (40 U IV) were prepared in identically coded syringes to blind resuscitation team members. Packages were distributed randomly, based on a random digit table, to cardiac arrest carts. If patients remained in asystole after the initial doses of either vasopressin or epinephrine, they received 1 mg of epinephrine for subsequent doses. All victims were treated by the same resuscitation team members. Our primary outcome was restoration of spontaneous carotid pulsation. The study results are shown in *Table 1*. Comparisons between groups were analyzed by student's t-test for continuous variables and chi-square test for categorical variables. Mean survival time was calculated for each group except for 1 case in the vasopressin group who survived for 1 month. The median overall survival time was 8 hr and 6 hr in the vasopressin and epinephrine groups, respectively. In this clinical trial, with an acceptable power of 80 %, we failed to show any improvement in the vasopressin group for short-term or long-term survival indices.

Another study investigated 200 patients with PEA, asystole, VT, or VF who were randomized using the same protocol. It concluded no superiority for vasopressin over epinephrine regarding in-hospital cardiac arrest (3). To explain the differences between studies, including ours, some issues should be considered: time elapsed from cardiac events to start resuscitation, underlying condition (leading to acidosis, hypoxia, etc), type of cardiac event (VT, VF, asystole), and in-hospital/out-of-hospital arrest. Our study had several limitations, such as small sample size in comparison to other studies and undifferentiated background diagnosis as a cause of asystole. We tried to control the confounding effects of these differences by good randomization. The distribution of these con-

* *Corresponding author at:* Davood Farsi, MD, Department of Emergency Medicine, Hazrat-e-Rasool Akram Hospital, Tehran, IR Iran. Tel: +98-2166518098, Fax: +98-2166525327, *e-mail:* davoodfa2004@yahoo
Received: 20 November 2010 Accepted: 02 March 2011

Table 1. Demographic characteristics and survival outcomes for two study groups

Variable	Vasopressin group	Epinephrine group	*P* value
Age, (Mean ± SD), y	72.16 ± 8.19	71.52 ± 9.03	0.794
Sex, No. (%)			
Men	11 (44)	-	-
Women	14 (56)	-	-
ROSC, No. (%)	9 (36)	10 (40)	≈1.00
Survival in first h, No. (%)	7 (28)	7 (28)	1.00
Survival in first 24 h, No. (%)	3 (12)	2 (8)	≈1.00
Median for overall survival time, h	8	6	-

founders was not similar between studies, which could have resulted in varying results. This study showed that vasopressin can be used just once as an alternative to epinephrine in the resuscitation of patients in asystole.

Keywords: Asystole; Vasopressin; Epinephrine; Cardiac arrest

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