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| ORIGINAL ARTICLE |

**Evaluating the Diagnostic Sensitivity of Doppler Ultrasonography of Carotid Artery in Determining the Adequacy of Shock Therapy Compared to Central Venous Catheter in Two Centers in Sanandaj**

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| Abstract |  |
| **Introduction:** Adjustment of vascular fluid volume in patients with severe injuries or admission to intensive care unit is difficult and vital. The aim of this study was to determine the diagnostic sensitivity of carotid artery Doppler ultrasonography in determining the adequacy of shock therapy compared to central venous catheter in hospitals of Sanandaj in 2018. **Methods:** In a descriptive-analytical study, 112 patients with hypovolemic shock (due to sepsis and ...) were evaluated in Tohid and Koswar Hospitals, Sanandaj from March to September 2018. To determine the flow intensity of carotid arteries, initially an echo device was used to collect the data since a portable ultrasonography device was not available but when it became available, the study was performed using portable ultrasonography devices. The study population included patients with hypovolemic shock (due to sepsis) presenting to Tohid and Kowsar hospitals, Sanandaj during 6 months. Trauma patients and those with cardiogenic shock and embolism-related shock were excluded. After the initial training of an emergency medicine resident by a radiologist, for all patients diagnosed with hypovolemic shock, the patient's characteristics including age, sex, blood pressure according to pressure gauge Mercury, heart rate per minute and inner diameter of the common carotid artery in systolic mode based on Doppler ultrasound were recorded. Then, the patient was treated based on the standard procedure using central venous catheter, and each time the fluid was administered, the flow intensity of the of the common carotid artery was calculated using the measured diameter and compared with the present method/Central venous catheter. The adequacy of treatment was confirmed when central venous pressure reached 8 to 15 after fluid therapy. Considering the normal distribution of quantitative data, "independent t-test" and "Pearson correlation coefficient" were used to analyze the hypotheses; and Chi-square test was used to evaluate the correlation between qualitative variables. Sensitivity and specificity were calculated using their respective formulas. The statistical software used was SPSS v.22. The study was approved by the ethics committee of Kurdistan University of Medical Sciences. **Results:** The results showed that 45.60% were female and the mean age of the population was 75.88 ± 10.82 years. The mean and standard deviation of the central venous pressure before and after shock therapy was 6.12 ± 0.65 and 7.88 ± 1.37, respectively. The mean diameter of the artery and flow intensity before and after lifting the foot were 6.92 ± 0.65, 7.37 ± 1.48 and 8.33 ± 1.81, respectively. Sensitivity, specificity and accuracy were 65.0%, 70.0% and 74.0%, respectively. Other results of the study showed that there was a significant positive correlation between findings of intravenous catheter and Doppler ultrasonography after treatment (r = 0.288, p = 0.002). **Conclusion:** The results of our study indicated that the sensitivity and specificity of Doppler ultrasonography were somehow acceptable in determining the adequacy of treatment, but more studies are recommended to confirm this. |
| **Key words:** Sensitivity and Specificity; Ultrasonography, Doppler; Shock |