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Ultrasonographic assessment of anatomical variations of internal jugular vein in patients undergoing hemodialysis catheter placement

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Objectives : Internal jugular vein (IJV) is the most common site for placement of a temporary hemodialysis (HD) catheter in chronic kidney disease (CKD) patients. IJV cannulation is associated with complications in up to 5-15% of cases. Using ultrasonography (USG) we aimed to determine the anatomical characteristics and relation of IJV to common carotid artery (CCA).

Methods : 693 patients with CKD that were to undergo IJV HD catheter placement were enrolled. Ultrasound probe was placed at the apex of Sedillot triangle and location of IJV was recorded as lateral, anterolateral, anterior, anteromedial, medial, posteromedial, posterior and posterolateral with respect to CCA. Any position other than lateral and anterolateral was defined as dangerous position.

Results : The most common position of IJV in relation to CCA was anterolateral on both sides (75.4% on right and 71.7% on left side). The anterior position was the most frequently observed dangerous position of IJV (15.3% on right and 19.8% on left). The dangerous position of IJV was seen more frequently on the left side than right ($p = 0.026$). Small sized IJV (≤7mm)was found in a significantly higher proportion of patients on the left side than the right ($p=0.001$).

Conclusions : In conclusion, our findings suggest that in about one-quarter of CKD 5 patients,IJV canhave dangerousrelation with CCA. Thus,external landmark guided approach for IJV cannulation may not be dependable always.We recommend routinely using ultrasonographic guidance to increase the chance of successful and safe IJV cannulation for hemodialysis access and to reduce the incidence of complications.

Keywords : internal jugular vein, ultrasonography, hemodialysis, chronic kidney disease