

Abstract:

Objective: Central vein catheterizations facilitate the establishment of reliable venous pathways in emergent medical situations. The subclavian is an important vein for central venous catheterizations. But, inadvertent arterial punctures during subclavian vein catheterizations are more dangerous than those during jugular or femoral vein catheterizations, because of the lack of a reliable compression site. We aimed to identify risk factors for the occurrence of inadvertent arterial puncture during subclavian vein catheterizations in crowded emergency rooms.

Patients and methods: We evaluated 190 patients undergoing bedside subclavian vein catheterizations in our emergency room, from which 62 patients experienced inadvertent arterial punctures. We evaluated possible risk factors from basic physical or laboratory tests that can easily be obtained in the ER, and performed Chi-square test, Kruskal-Wallis ANOVA, non-conditional logistic regression analysis, and receiver-operating characteristic curves to determine the cut-off values of the identified risk factors.

Results: We identified age, BMI, and serum pre-albumin level as significant risk factors for inadvertent arterial puncture during subclavian vein catheterization ($p < 0.05$) through regression analyses (odds ratios of 1.043, 0.719 and 0.989; and receiver-operating characteristic curves with AUCs of 0.741, 0.818, and 0.717, respectively). The cut-off values for age, BMI and serum pre-albumin level were 66.5 years old, 21.12 and 109.5 mg/L, respectively.

Conclusions: We found that patients with poor nutritional status (BMI < 21.12 and serum pre-albumin < 109.5 mg/L) or older than 69.5 years tended to experience more accidental arterial punctures during subclavian vein catheterizations, probably due to atrophy or diminished peri-vascular support tissues in patients with poor nutritional statuses that make it difficult to obtain adequate chest extensions.

Reference:

Zhou YH, Jiang WS, Shao JW, Zhou WJ, Sheng HQ, Shen T, Mao EQ, Wang YH. Risk factors for inadvertent arterial puncture during subclavian vein catheterization. *Eur Rev Med Pharmacol Sci.* 2020 Oct;24(20):10612-10618. doi: 10.26355/eurrev_202010_23419. PMID: 33155219.