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Research Article

**A RESEARCH STUDY TO COMPARE THE SUCCESS RATE OF
NEEDLE SUBCLAVIAN PUNCHING FROM THE INTERNAL
JUGULAR VEIN AND THE COMPLICATIONS OF THE
SUPRACLAVICULAR APPROACH**¹Aysha, ²Dr. Hamna Laleen, ³Khadija Aslam Bara¹Punjab Medical College Faisalabad²Service Hospital Lahore³Shaikh Khalifa Bin Zayed Al Nahyan Medical and Dental College Lahore**Abstract:**

Objective: The purpose of this research study is to get the comparison of success rate between Supraclavicular and jugular approach for subclavian vein cleavage.

Study design: Comparative method study.

Place and Duration: Current research study was carried out in the period of 12 months starting from April, 2017 to March 2018 at central hospital, cardiology department, Lahore.

Material and Methods: Total of 126 patients were selected for current comparative study who were undergoing central venous catheterization treatment. Divided all patients into two equal groups, Internal jugular (IJ) and subclavian (SC) each having 63 patients. Compared the successful procedure and catheter malposition in both IJ and SC groups in the treatment of arterial puncture pneumothorax, complications such as tooth and catheter flexion.

Results: The results of both groups were approximately similar according to findings of this study. 17 males and 46 females of the SC group had an average age of 38.67 ± 17.14 years and 21 males and 42 females of the IJ had a mean age of 41.77 ± 15.05 years. The results of the process were successful after three procedures in 87.3% (55) patients of Internal jugular (IJ) group and 84.1% (53) patients of subclavian (SC) group. A complication of producing catheter circulation and catheter abnormal position sequence makes approximately same frequency in patients of these groups. Difficulty was faced in Arterial puncture process in 4.76% (3) patients of the SC group and 7.93% (5) patients of the IJ group. Pneumothorax arose in 1.59% (1) patients of SC group and 3.33% (2) patients of IJ group.

Conclusion: The results of the successful rate of supraclavicular or subclavian approach were approximately similar as compared to internal jugular venous puncture for perforation and central venous catheterization complications according to findings of current study.

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INTRODUCTION:

In intensive care units for hemodialysis access, trans venous cardiac stimulation, hemodynamic control, operation chambers and fluid resuscitation commonly adapted procedure is central venous catheterization. For the application of large volume solutions and long-term total parenteral nutrition for hemodialysis, the central venous line is mostly convenient. Femoral venules, internal jugular vein and subclavian are possible procedures for central venous catheterization. Most anesthesiologists prefer the internal jugular rather than other methods because the pneumothorax associated with this procedure is less likely. On the other hand, it remains to be usual problem of accidental arterial puncture. Due to the risk of any further infection, the femoral route is not encouraged. Through infraclavicular or supraclavicular approaches, subclavian vein is accessible. Since the Supraclavicular subclavian vein approach is prevented from increasing the risk of pneumotorax, Supraclavicular approach is less fortunate than pneumothorax and arterial puncture due to the infraclavicular approach to the subclavian vein and as a result it makes available an excellent route. Hence, a good alternative is internal jugular approach. Albeit some papers notify that the easiest approach is central venous catheterization. Despite of its theoretical superiority, the subclavian venous supraclavicular approach is not usually applied. Anyhow there are some research papers showing subclavian plexus for central venous line placement and the comparison of the internal jugular to Supraclavicular approach. Current research study was also conducted to compare the most forgotten method and the most commonly used method, and for the comparison of the supraclavicular approach of the inner jugular and the subclavian venous.

MATERIALS AND METHOD:

The present comparative research study was completed in the period of one year, started from

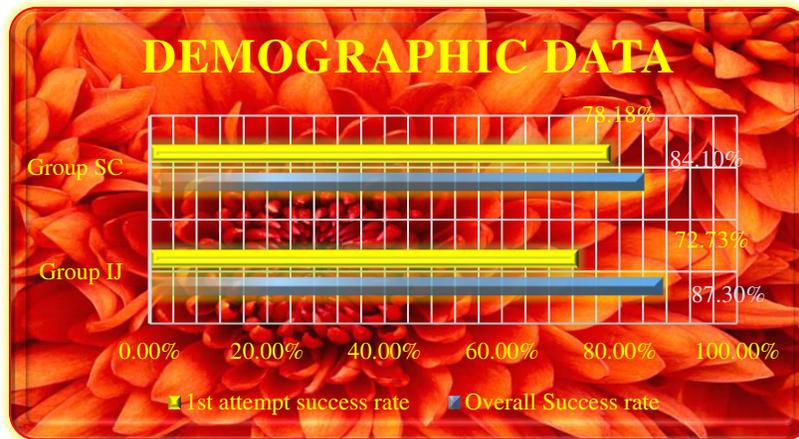
April, 2017 and ended in March 2018 at central hospital, cardiology department, Lahore after the written permission of ethical committee of Hospital. Only those patients were selected, total number of 126, who needed central venous catheterization for any indication in anesthesia or intensive care unit. Took a written consent from all nominated patients and also briefed the patients about the events and described about the purpose of the study. Patients were also asked to complete a questionnaire about their previous history of any disease and other required data such as gender, name, age, number of interventions, catheterization success, complications, hospital registry number and alternative pathway use in case of failure for analyses. 63 patients were placed in the internal jugular (IJ) group and 63 patients in subclavian (SC) group. confidence level of 95% and accuracy of 2% to 5% was used. The expected complication was 1.7% in the SC group and 7% in the IJ group. Described complications related to catheter insertion were pneumothorax, arterial puncture, catheter obstruction, catheter malposition and threading strength. Assessment of position of the catheter and detection of other complications was done through gathering the immediate portable chest radiographs. SPSS version 20 was used to analyze all data. Age and mean \pm SD which were chosen as continuous variables and an independent sample T-test was used in both groups to compare data. Frequency and percentage which were chosen as qualitative variables and a square test was used in both groups to compare the resultant data. P value less than 0.05 was considered significant.

RESULTS:

Amongst the selected 126 patients there were 17 males and 46 females of the SC group had an average age of 38.67 ± 17.14 years and 21 males and 42 females of the IJ had a mean age of 41.77 ± 15.05 years. Demographic data is compiled below in the Table No 1.

Table No 1: Demographic Data

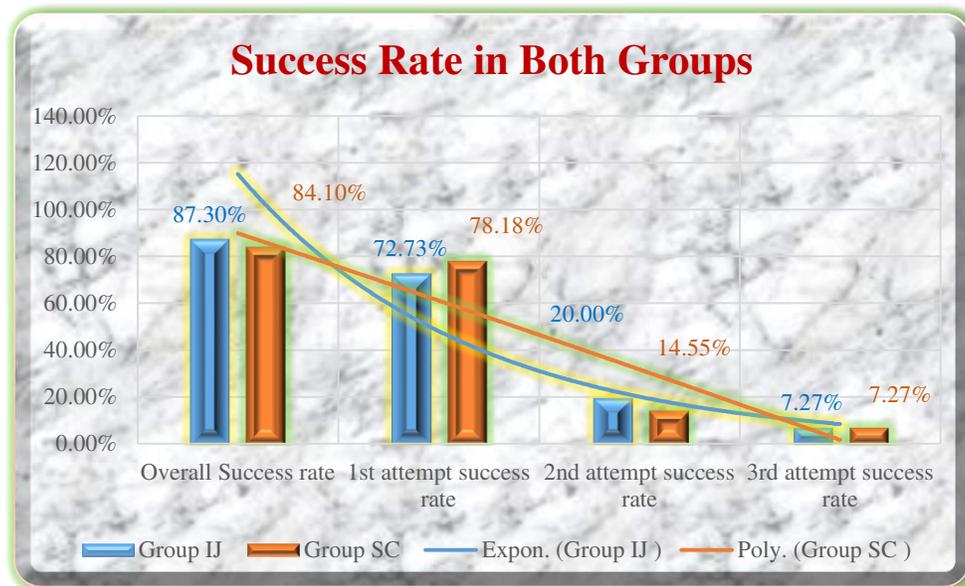
Characteristics	Group IJ (n=63)	Group SC (n=63)	P Value
Age in Years (Mean \pm SD)	41.77 \pm 15.05	38.67 \pm 17.14	0.056
Gender	Male	21 (33.33%)	0.56
	Female	42 (66.67%)	



After three attempts, results of the process were successful in 87.3% (55) patients of Internal jugular (IJ) group and 84.1% (53) patients of subclavian (SC) group. In the first attempt the success rate was as 72.73% (40) patients of Internal jugular (IJ) group and 78.18% (43) patients of subclavian (SC) group. In the second attempt the success rate was as 20.00% (11) patients of Internal jugular (IJ) group and 14.55% (08) patients of subclavian (SC) group. In the third attempt the success rate was as 07.27% (04) patients of Internal jugular (IJ) group and 07.27% (04) patients of subclavian (SC) group. The tabular form is shown below.

Table No 2: Success Rate in Both Groups

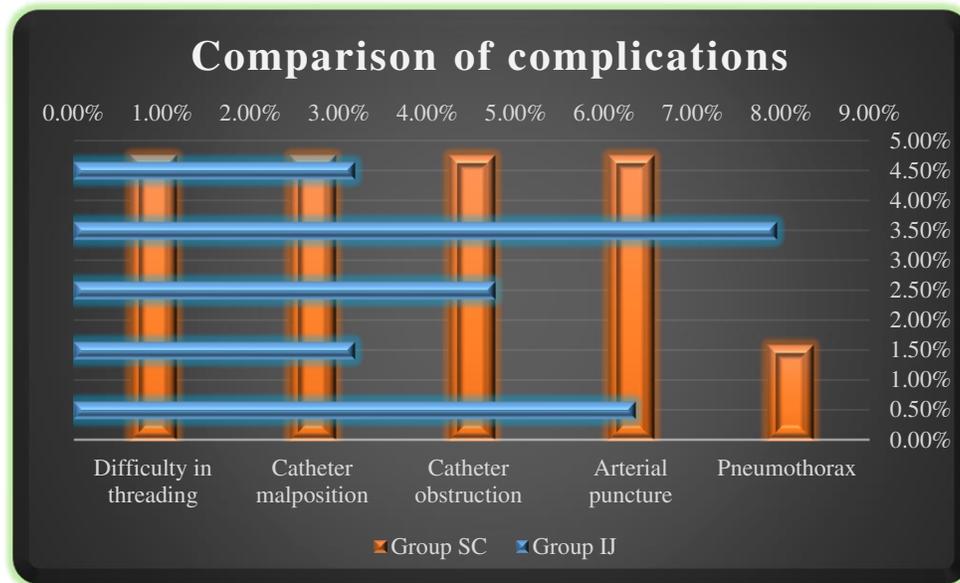
Characteristics	Group IJ (n)	Group SC (n)
Overall Success rate	87.30% (55)	84.10% (53)
1 st attempt success rate	72.73% (40)	78.18% (43)
2 nd attempt success rate	20.00% (11)	14.55% (08)
3 rd attempt success rate	07.27% (04)	07.27% (04)



In all unsuccessful cases, the alternative route has been successfully used for central venous catheterization. The complication rates in both groups are summarized in Table No 3 and are similar.

Table No 3: Comparison of Complications with 2 Different Approaches

Comparison	Group IJ (n=63)	Group SC (n=63)	P Value
Difficulty in threading	6.35% (4)	4.76% (3)	0.659
Catheter malposition	3.17% (2)	4.76% (3)	0.645
Catheter obstruction	4.76% (3)	4.76% (3)	1.000
Arterial puncture	7.94% (5)	4.76% (3)	0.465
Pneumothorax	3.17% (2)	1.59% (1)	0.559

**DISCUSSION:**

According to the analyses of current study, results are very clear that the supraclavicular approach to the subclavian venous pouch is as safe as the internal jugular venous puncture for central venous catheterization. These results are similar to a previous study by Ruesch et al. in which it was found that there was no significant difference in complication rates between the internal jugular vein puncture and the subclavian vein puncture except for the slightly higher arterial puncture risk with the internal jugular approach. In another study by Muhm et al it was found that strength was as like safe to other techniques of catheter insertion. All these findings are very similar to present study findings. Anyhow, there were not found significant dissimilarities in arterial puncture frequency, between these two approaches.

Biffi et al. also stated in his research about insignificant dissimilarities in complication rates among jugular and subclavian approaches. Also no significant difference by meta-analysis was shown in complication rates among the supraclavicular approach to the internal jugular venous perforation

and subclavian vein. In this study the results of meta-analysis were constant. In current study success rate calculated is 84% with a supraclavicular approach that was very similar to that reported in the other researches. Success rate of 79-100% with supraclavicular approach were stated through different studies.

CONCLUSION:

The choice of central venous access site and approach is depending on the conditions of the patient and on the experience of the neurosurgeon. The successful rate of supraclavicular or subclavian approach was almost same as compared to internal jugular venous puncture for perforation and central venous catheterization complications as per findings of this comparative research study.

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