



**ORIGINAL RESEARCH PAPER**

**Cardiology**

**PREDILECTION & SAFETY OF TRANSRADIAL CORONARY INTERVENTION IN THE ELDERLY POPULATION**

**KEY WORDS:** Cag - Coronary Angiogram, Csa - Chronic Stable Angina; Acs - Acute Coronary Syndrome

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**ABSTRACT**

**BACKGROUND:** Transradial artery access for coronary intervention procedures is a safe and beneficial technique<sup>1</sup>. The safety aspects are well established in young individuals<sup>2</sup>. Elderly patients have been considered as a higher risk due to increased vascular tortuosity, calcifications and other access site related complications in comparison to younger individuals<sup>3</sup>. This study was done to assess the feasibility, efficacy and safety of transradial coronary angiography or intervention in the elderly.

**MATERIALS & METHODS:** This study was conducted in the department of Cardiology, Chengalpattu Medical College Hospital in patients admitted coronary angiogram either for acute coronary syndrome or chronic stable angina during the period from November 2018 to April 2019. A total of 149 patients who underwent coronary angiography/ intervention through radial artery access were studied. Patients were divided into elderly population with age at or above 65 years (n = 24) & non elderly with age less than (n=125). Most of the patients who underwent procedure in both the groups are for acute coronary syndrome (ACS) than chronic stable angina (CSA), elderly arm (ACS vs. CSA – 91.6% vs. 8.3%) & non elderly arm (ACS vs. CSA – 90.4% vs 9.6%). The two groups of population were analyzed with respect to complications such as vascular site bleeding, stroke, procedural time & access site cross over.

**RESULTS:** The mean age was 72 ± 3.3 years in the elderly group and 49 ± 5.3 years in the non-elderly group. Baseline serum creatinine values were slightly elevated in elderly arm. The procedural time was higher in elderly arm than non elderly arm both in diagnostic (16 min 20 secs vs. 2 min 45secs) as well as in interventional (41min 32 secs vs. 19 min 18 secs) procedures. But the volume of contrast utilized is same in both arms with average of 40ml vs 42ml in elderly vs. non elderly arm respectively. Occurrence of puncture site bleeding or occlusion of radial artery showed no difference between two arms. The procedure completion was equally safe in both elderly and non elderly group (85% vs. 86%). Access site cross over rate due to vessel tortuosity was higher in elderly arm (8% vs. 1.5%) where as vasospasm was less in elderly compared to non elderly group (2.4% vs 7%). No case of thrombotic or bleeding risk or stroke were seen in both the arm.

**CONCLUSION:** Transradial coronary angiography or intervention is safe and complication rates are comparable with those in non elderly patients. Procedural time for the completion of procedure is high in elderly than in non elderly due to tortuous vessel anatomy, difficulty in engaging the coronary artery & operator efficacy etc.

**INTRODUCTION:**

Over the last 2 decades, the uptake of transradial coronary procedures has spreaded across the globe<sup>4</sup>. It has been well documented the beneficial aspects of radial artery access than femoral artery access through large RCT like RIVAL trial<sup>5</sup>, OCTOPLUS<sup>6,7</sup> study. The primary end point, a composite of vascular complications, transfusion and drop in hemoglobin were significantly lower in the radial group. The radial group had similar contrast volume but longer procedure duration and higher radiation exposure. The access site cross over were similar with 8%- 9%. National Cardiovascular Data registry form 606 sites in United States between 2004 and 2007 clearly highlighted the lower risk of bleeding complications with radial than femoral access<sup>8</sup>. However this observational data evident the advantage of radial access in patients of aged less than 65 years. Despite the potential benefit of radial access it was inconsistently used less in elderly population. These sentences were echoed in an observational study conducted in United States involving 17509 patients between 2008 & 2011 in which elderly patients were less likely to be offered radial access<sup>9</sup>.

**MATERIALS & METHODS:**

This is retrospective observation study conducted at Department of Cardiology, Chengalpattu Medical College Hospital from November 2018 to April 2019. Patient who are diagnosed coronary artery disease either acute coronary syndrome or chronic stable angina during the period and underwent diagnostic with or without coronary intervention as per Institute protocol were analysed in this study. The patient population were divided in respect to age with cutoff 65 and

above as elderly population and rest as non elderly population. Patient underwent coronary angiogram with Philips cath lab equipments at Cath laboratory, Chengalpattu Medical College Hospital with proper precautions. Serum creatinine was taken in account and estimated glomerular filtration rate was calculated using CKD EPI formula pre and post procedure respectively in both arms. During the procedure at most precaution was taken to reduce the radiation for the patient and operator. The procedure was done through right radial above the styloid process with 5F or 6G hemostatic sheath. Procedural difficulties encountered by various operators were recorded immediately post procedure itself. Quantum of contrast utilized and fluoro time was recorded.

These parameters were analyzed between two arms. n = 149;

Parameters	Elderly arm (n – 24)	Non elderly arm (n - 125)
Procedural success Without complications	85%	86%
Procedural time	16 min 20 secs	2 min 45secs
a)Diagnostic procedure	41min 32 secs	19 min 18 secs
b)Interventional procedure		
Contrast usage	40ml	42ml
Vascular spasm	33%	58%
Access site cross over due to vascular spasm	2.4%	7 %
Access site cross over due to Vascular tortuosity	8%	1.5%

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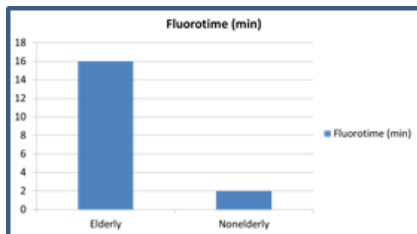
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Bleeding	< 1%	< 1%
Difficult in engaging coronary sinus	28 %	9%
Thrombotic occlusion of radial artery	0%	0%
Stroke	0%	0%
Hospital stay	1 – 2 days	1-2 days

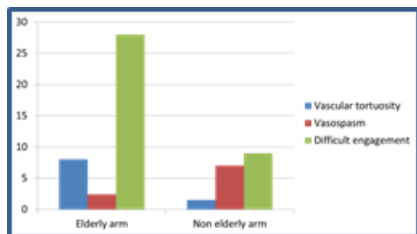
**RESULTS:**

The mean age was 72 ± 3.3 years in the elderly group and 49 ± 5.3 years in the non-elderly group. Baseline serum creatinine values were slightly elevated in elderly arm with means of 1.15 (mean eGFR 68ml/min) where as in non elderly mean serum creatinine was 1.0 with mean eGFR 94ml/min). The procedural time was measured in terms of fluoro time required to complete the procedure. It was higher in elderly arm than non elderly arm both in diagnostic as well as in interventional procedures.



Average fluorotime for diagnostic angiogram in elderly (16 min 20 secs) and in non elderly arm (2 min 45secs) whereas fluorotime for coronary intervention in elderly is 41min 32 secs & in non elderly is 19 min 18 secs. Excess procedural times is mainly due to complex vascular anatomy , entering ascending aorta due to excess tortuous of brachiocephalic and difficult engagement of coronary sinus ostium due to dilated aorta.

But the volume of contrast utilized is same in both arms with average of 40ml vs 42ml in elderly vs. non elderly arm respectively. Occurance of puncture site bleeding or occlusion of radial artery showed no difference between two arms. More than 85 % patients in elderly arm underwent the procedure safely compared to 86% in non elderly arm.



Access site cross over rate was 8% in elderly arm with major reason is vessel tortuously especially at subclavian and brachiocephalic whereas access site cross over in non elderly was 7% with major reason is vasospasm. No case of thrombotic occlusion or bleeding risk or stroke seen in both the arms.

**SUMMARY:**

Due to increase in life expectancy, elderly patients undergoing coronary interventions are increasing worldwide. These groups of people are at high risk of both bleeding and ischemic complications. Transradial access for coronary intervention is proved its benefit beyond doubt in reduction of above complications than femoral access<sup>10</sup>. But many RCT cum observations studies shows this benefit in young age population. Radial access is currently very much underutilized in elderly population. From our observation study it is clear that transradial access is beneficial, safe and efficacy in elderly population with minimal complications.

Procedural time and radiation exposure are high due to various reasons such as complex vascular anatomy, learning curve of the operator etc.

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