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Original research article

Impact of the radial versus femoral access for primary percutaneous intervention on smoking cessation rates: A paradoxus between the health related quality of life and smoking quitting?

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ABSTRACT

Background: Smoking cessation is potentially the most effective secondary prevention measure and improves prognosis after acute ST-segment elevation myocardial infarction (STEMI), but more than half of the patients continue to smoke after STEMI. The awareness of the disease's severity and the short hospital stay at the index STEMI have been found to be associated with persistent smoking after STEMI.

Objective: To assess whether the paradoxical relationship between smoking quitting rates and health-related quality of life (QOL) scores in STEMI patients undergoing primary percutaneous intervention (pPCI) by radial (RA) versus femoral approach (FA).

Methods: Our population is represented by 138 STEMI patients undergoing pPCI by FA or RA. The smoking cessation rates and QOL scores were evaluated.

Results: Patients at RA group (46 patients, 57 ± 9 years, 87% male) had a higher European Quality of Life-5 Dimensions (EQ-5D) index score at post-PCI first week compared to FA group (92 patients, 57 ± 8 years, 75% male) [FA: median 0.81 (0.22) vs. RA: 1 (0.22), $p = 0.042$], although it was similar at baseline [FA: median 1 (0) vs. RA: 1 (0), $p = 0.992$]. Total hospital length of stay [RA: median 3 (1) day vs. FA: 4 (1), $p < 0.001$] was significantly reduced in the RA group. Whereas the smoking cessation rates at 1-year post-discharge were 41% in RA group, it was 67% in FA group ($p = 0.003$). Female sex, pain-to-door time and RA during p-PCI were independent predictors of continued smoking after STEMI.

Conclusion: This study shows that the smoking cessation was lower in RA group compared to FA group. The more comfortable conditions of STEMI management related to RA may cause a

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lower awareness of the disease severity and lower motivation to quit smoking. Therefore, it is important to inquire about smoking status at each clinical encounter, particularly in patients undergoing pPCI by the radial approach.

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Introduction

Transradial percutaneous coronary intervention (PCI) is a safe and effective method of coronary revascularization [1]. Although there has been also concern that technical difficulties by transradial approach (RA) can delay achievement of reperfusion during primary PCI (p-PCI) for acute ST-elevation myocardial infarction (STEMI); the RA has been offer some advantages compared to transfemoral approach (FA) especially under conditions of aggressive anticoagulation and anti-platelet treatment [2].

Despite the established causal relationship between tobacco smoking and coronary artery disease [3], many patients continue to smoke after STEMI [4]. This partly reflects ignorance of the beneficial effects of smoking cessation even after diagnosis. The other key drivers of smoking cessation are the awareness of the disease's severity [5]. Previous studies showed that a clinical event acts as an important motivator and may induce behavioral change, particularly if this event is perceived as life-threatening as is the case with patients' first STEMI [4]. Indeed, smokers are often strongly motivated to quit in that acute phase of the coronary event [6]; therefore, hospitalization for an acute cardiovascular event provides an important opportunity for smoking cessation. On the other side, the short hospital stay at the index STEMI has been found to be associated with persistent smoking after STEMI [7]. The patient satisfaction with RA contributes to both physical and mental health-related quality of life (QOL) [8]; however, despite these apparent benefits and encouraging global QOL findings in RA patients, these patients very often undervalue the disease's severity and usually have a misperception of the risk of STEMI. Therefore, we aimed to assess whether the paradoxical relationship between smoking quitting rates and QOL in STEMI patients undergoing primary PCI by RA versus FA.

Method

One hundred thirty-eight consecutive patients with STEMI undergoing p-PCI were included to study. Patients were divided into two groups as patients undergoing p-PCI transfemorally (FA group) and patients undergoing transradially (RA group) based on the operator's individual preference. All patients were active cigarette smokers at the time of admission. Never smokers, previous smokers and patients with crossover RA to FA were excluded. The professional inpatient or outpatient smoking cessation program has not received any professional patients in addition to usual care to physician-delivered smoking cessation advice and counseling.

The primary study endpoints were the periprocedural QOL measures and smoking cessation rates at 1 year after discharge. Extensive data, including self-reported smoking habits, were obtained at baseline and post-discharge 1-year follow-up. Secondary endpoints included 1-year follow-up major adverse cardiac events.

We examined patient health status including QOL, symptoms, and functional capacity, at the baseline (prior to p-PCI) and post-PCI first week. Health status was assessed directly from patients using the European Quality of Life-5 Dimensions (EQ-5D) instrument, which includes five domains (mobility, self-care, usual activities, pain/discomfort, and anxiety/depression) using a 3-point scale (1 = no problems, 2 = moderate problems, 3 = extreme problems) [9]. From the health-state profile obtained, a scoring algorithm was used to calculate a total utility score (EQ-5D index score) between 0 (represents death) and 1.0 (represents perfect health).

Statistical analyses were performed using Statistical Package for Social Sciences (SPSS) for Windows 20 (IBM SPSS Inc., Chicago, IL). Assuming a ratio of 2:1 for FA to control RA subjects, a total sample size of 138 was calculated to achieve the desired power of 0.90 with an alpha value of 0.05. Normal distributions of variables were evaluated with Kolmogorov–Smirnov test. Numerical variables with a normal distribution were presented as the mean \pm standard deviation and numerical variables with a skewed distribution were presented as the median (interquartile range) and categorical variables were presented as percentages (%). Two group comparisons of normally distributed variables were tested by unpaired t test. The nonparametric Mann–Whitney U-test was used for comparisons of non-normally distributed variables. Predictors of smoking cessation were determined by logistic regression analysis. For all tests, a two-tailed p-value less than 0.05 was defined statistically significant.

Results

There were 92 patients in FA group and 46 patients in RA group. Basal demographics and comorbidities were similar between groups (Table 1).

Patients at RA group had a higher EQ-5D index score at post-PCI first week compared to FA group [FA: median 0.81 (0.22) vs. RA: 1 (0.22), $p = 0.042$], although it was similar at baseline [FA: median 1 (0) vs. RA: 1 (0), $p = 0.992$]. Patients in the RA group reported fewer problems with mobility (RA: 100% vs. FA: 91%, $p = 0.039$) and anxiety and/or depression (RA: 59% vs. FA: 91%, $p < 0.001$), but higher problems with access site pain (RA: 22% vs. FA: 8%, $p < 0.026$). Total hospital length of stay was significantly shorter in the RA group [RA: median 3 (1) day

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