

## ORIGINAL ARTICLE

## ASSESSMENT OF ACUTE CORONARY SYNDROME PATIENTS' KNOWLEDGE REGARDING TREATMENT OPTIONS FOR REVASCULARIZATION AFTER CORONARY ANGIOGRAPHY

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**Objectives:** The objective of this study was to assess the knowledge of acute coronary syndrome (ACS) patients regarding revascularization procedure following coronary angiography at a tertiary care cardiac center of Karachi, Pakistan.

**Methodology:** This descriptive cross-sectional study included newly diagnosed adult patients of ACS admitted to the inpatients department. However, patients with the diagnosis of ST-segment elevation myocardial infarction (STEMI) undergone primary PCI were excluded. Patients' knowledge level was assessed by interviewing patients with questionnaire consisted of a total of 10 multiple choice questions. Patients' response against each of the question was verified by the patient's hospital record file and categorized as correct or incorrect. Patients with  $\geq 70\%$  correct responses (7 out of 10) were categorized to have had sufficient knowledge about revascularization.

**Results:** A total of 130 patients were included with mean age of patients was  $57.42 \pm 18.43$  years and majority of patients, 86.2% (112), were males. Sufficient knowledge regarding revascularization procedure was observed in only 37.7% (49) patients. Male patients had significantly higher frequency of sufficient knowledge than female patients (40.2% (45/112) vs. 22.2% (4/18);  $p < 0.001$ ). Similarly, knowledge level was significantly higher among urban resident than rural residents with frequency of 41.1% (39/95) vs. 28.6% (10/35);  $p = 0.009$ . Likewise educational status ( $p < 0.030$ ) and age of the patients ( $p = 0.003$ ) were also found to be a significant factors associated with sufficient knowledge.

**Conclusion:** Majority of patients had insufficient knowledge regarding acute coronary syndrome and its revascularization options among ACS patients. It is the need of hour to define strategies to so educate and counsel these patients properly.

**Keywords:** acute coronary syndrome, revascularization, PCI, CABG, knowledge

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### INTRODUCTION

Cardiovascular diseases (CVD), which include ischemic heart disease, cardiac failure, stroke, peripheral arterial disease, and variety of other cardiac and vascular illnesses, are the main causes of deaths worldwide and a significant contributor to lower quality of life.<sup>1,2</sup> According to an estimation CVD claimed lives of around 17.8 million people globally in the year 2017.<sup>1,2</sup> The majority of deaths from CVD are due to coronary heart diseases (CAD) including acute myocardial infarction (AMI) – responsible for around 43% of the CVD deaths.<sup>3</sup> Approximately 80% of worldwide CVD mortalities occur in underdeveloped and developing countries owing to the increase in burden of CVD and risk factors due to a continuous epidemiological change.<sup>4,5</sup>

Patients having AMI require prompt treatment to have a satisfactory outcome.<sup>6</sup> Though, pre-hospital delays in requesting AMI therapy have remained improperly long in latest decades, with median intervals ranging 2-4 hours.<sup>7,8</sup> Misperception of symptoms, misreading of symptoms and postponement in getting medical assistance are the three major hurdles that result in extended pre-hospital delay.<sup>8</sup> For both healthcare providers and patients, directing patients through complicated language, pathophysiological ideas and a wide range of treatment options in a short amount of time is a traumatic and exhausting procedure.<sup>9</sup> Thanks to substantial textual information, informative audiovisual contents, and digitalized visual presentation that patient's education and knowledge has improved.<sup>10</sup> There have been some efforts to improve education and anatomical understanding in patients who have had a myocardial infarction.<sup>11</sup>

Current guidelines for management of patients with cardiovascular disease frequently advise that patients “preferences and values” must be taken into consideration and include them in “decision making”. Apart from that, we have scarcity of objective published data from patients’ point of view as well as insufficient directions on how to successfully include patient in decision making process.<sup>11</sup>

Current clinical practice guidelines suggested that patients having acute coronary syndrome (ACS) should be treated with invasive strategy. Invasive strategy includes two options; coronary artery bypass grafting (CABG) surgery and percutaneous coronary intervention (PCI). The clinical presentation, comorbidities, anatomical complications of CAD, and baseline characteristics of the patient all influence the choice of the most suitable method.<sup>12</sup> There are two modes of invasive revascularization strategy i.e. routine or conservative. In routine invasive strategy, angiography is done, followed by coronary revascularization if indicated (either by CABG or angioplasty). In conservative (selective) strategy, patients are initially managed on aggressive pharmacologic therapy followed by selection for angiography based on clinical symptoms. These patients are then treated with one of the procedures if they develop high risk features or refractory symptoms.

Although cardiologists and surgeons argued about the best approach of revascularization, a very little is known about patients’ perspectives.<sup>13</sup> When dealing with diseases that have more than one feasible treatment option, patients and doctors may evaluate trade-offs in a different way. Patients’ priorities can be assessed based on their treatment alternatives selections, which reflects how important each therapy attribute is to them.<sup>14</sup>

Role of patient in decision making regarding treatment strategy is very limited due to lack of adequate knowledge at the part of patient. Time restrictions, lack of applicability relating to patient features and clinical context are common impediments. Other elements that have been documented as barriers include health experts’ motivation, favorable influence on the process and positive impact on patient outcomes.<sup>15</sup> Therefore, aim of this study was to assess the knowledge of ACS patients regarding revascularization procedure following coronary angiography at a tertiary care cardiac center of Karachi, Pakistan.

## METHODOLOGY

This descriptive cross-sectional study was conducted at the National Institute of Cardiovascular Diseases (NICVD) Karachi, Pakistan between October 2017 and March 2018. Study included newly diagnosed adult patients of acute coronary syndrome admitted to the inpatients department for either conservative or invasive management. However, patients with the diagnosis of ST-segment elevation myocardial infarction (STEMI) undergone primary PCI were excluded. Patients with prior history of CABG or PCI or patients with superimposed heart failure or other cardiomyopathies, and patients with mental ailments were excluded. As per the ethical standards study was approved by the ethical review committee of the institutions and consent for participation and publication was obtained from all the included patients.

Data were collected by the investigator on a predefined questionnaire proforma. Questions were read out to the patient by investigator. Demographic variables which were considered to be the potential confounders were included in questionnaire such as age (years), gender, education level, residence (rural or urban), and socioeconomic status. Patients’ knowledge level was assessed by interviewing patients with specific questions regarding knowledge about their diagnosis, severity of disease, treatment option suggested to them. Knowledge assessment questionnaire consisted of a total of 10 multiple choice questions (MCQs). Questionnaire and corresponding correct answers were verified and endorsed by the three independent senior faculty members. Patients’ response against each of the question was verified by the patient’s hospital record file and categorized as correct or incorrect. Patients with  $\geq 70\%$  correct responses (7 out of 10) were categorized to have had sufficient knowledge about revascularization otherwise insufficient knowledge.

Analysis of collected data were performed with the help of statistical software IBM SPSS version 19. Mean  $\pm$  standard deviation (SD) were computed to express the continuous variable such as age and duration of ACS. Frequencies and proportions were computed to express categorical variables such as gender, education level, residence (rural or urban), socioeconomic status, level of knowledge regarding revascularization. Age, gender, socioeconomic status, residence (rural or urban), and level of education were stratified to analyze their effect on the outcome variables i.e. the level of knowledge regarding revascularization. Chi-Square was performed to detect the association and p-value  $\leq 0.05$  was taken as significant.

**RESULTS**

A total of 130 patients fulfilling the inclusion criteria were interviewed for their knowledge regarding revascularization. The mean age of patients was 57.42 ± 18.43 years and majority of patients, 86.2% (112), were males and the mean duration of ACS symptoms which patient developed was 5.31 ± 1.74 weeks. Most of patients (73.1%) were from urban areas and almost half of the patients (49.2%) belonged to middle socio-economic status and other 41.54% were from lower socio-economic status. The education level was under matriculation with 7.7% (10) patients illiterate, 40.8% (53) were primary educated, and 33.8% matriculated (Table 1).

**Table 1: Baseline demographic characteristics of the patients**

Characteristics	Total
<b>Total (N)</b>	<b>130</b>
<b>Gender</b>	
Male	86.2% (112)
Female	13.8% (18)
<b>Age (years)</b>	
< 45 years	9.2% (12)
45 to 54 years	35.4% (46)
55 to 64 years	40% (52)
65 to 75 years	15.4% (20)
<b>Socio-economic status</b>	
High	9.2% (12)
Middle	49.2% (64)
Low	41.5% (54)
<b>Residence</b>	
Urban	73.1% (95)
Rural	26.9% (35)
<b>Education</b>	
Illiterate	7.7% (10)
Primary	40.8% (53)
Matric	33.8% (44)
Graduate	11.5% (15)
Post-Graduate	6.2% (8)

Sufficient knowledge among ACS patients regarding revascularization procedure was observed in only 37.7% (49) patients, remaining 62.3% (81) patients had knowledge score of <70%. About three fourth (74.6%) patients knew the diagnosis of their disease, about 55% of the patients thought that the condition was deadly and they could have died if not reached the hospital on time.

The stratified analysis showed that age of patient was a significant confounder (p=0.003) for the knowledge regarding revascularization procedure. It was noted that with the increasing age the frequency of sufficient knowledge was decreasing such that it was 50% (6/12) among patients of age 35-44 years which declined to 30% (6/20) among patients of age 65-75 years. Male patients had significantly higher frequency of sufficient knowledge than female patients (40.2%

(45/112) vs. 22.2% (4/18); p<0.001). Similarly, knowledge level was significantly higher among urban resident than rural residents with frequency of sufficient knowledge as 41.1% (39/95) vs. 28.6% (10/35); p=0.009. Likewise educational status was also found to be a significant factors associated with sufficient knowledge regarding revascularization procedure (p<0.030). It was noted that frequency of sufficient knowledge was 0% (0/10) among illiterate patients and it increased to the maximum of 87.5% (7/8) among highest educated (post-graduate) patients (Table 2).

**Table 2: Assessment of knowledge level regarding revascularization procedure by demographic characteristics of the patients**

Characteristics	Level of knowledge		P-value
	Sufficient	Insufficient	
<b>Total (N)</b>	<b>49 (37.7%)</b>	<b>81 (62.3%)</b>	-
<b>Gender</b>			
Male	91.8% (45)	82.7% (67)	<0.001*
Female	8.2% (4)	17.3% (14)	
<b>Age (years)</b>			
< 45 years	12.2% (6)	7.4% (6)	0.003*
45 to 54 years	38.8% (19)	33.3% (27)	
55 to 64 years	36.7% (18)	42% (34)	
65 to 75 years	12.2% (6)	17.3% (14)	
<b>Socio-economic status</b>			
High	20.4% (10)	2.5% (2)	0.066
Middle	59.2% (29)	43.2% (35)	
Low	20.4% (10)	54.3% (44)	
<b>Residence</b>			
Urban	79.6% (39)	69.1% (56)	0.009*
Rural	20.4% (10)	30.9% (25)	
<b>Education</b>			
Illiterate	0% (0)	12.3% (10)	0.030*
Primary	14.3% (7)	56.8% (46)	
Matric	44.9% (22)	27.2% (22)	
Graduate	26.5% (13)	2.5% (2)	
Post-Graduate	14.3% (7)	1.2% (1)	

\*significant at 5%

**DISCUSSION**

There is a rapid need of public health programs with intentions to increase the awareness regarding health of heart among population around the world. Besides, the knowledge regarding the specific conditions of CVD as well as the available revascularization options for such conditions also need to be raised. It is a fact that regardless of significant progress in identification of effective treatments for heart attacks and strokes, there are considerable challenges in putting these treatments into practice. It is due to lack of complete and proper knowledge provided to the patients and their attendants and lack of their understanding regarding the cardiovascular diseases. This leads to an unnecessary but avoidable delay in seeking care by these patients as it remains unclear to them regarding which option of revascularization they should choose

for their health. In the literature, the issue of poor adherence to medical therapy is well known. Patients' comprehension of their diseases and treatment is reported to be directly linked to adherence.<sup>16</sup>

Keeping the fact in mind that it is utmost necessary for the cardiac patients to have proper knowledge of their disease and available treatment options, we conducted this study in inpatient department of a tertiary care cardiac center. Our study found that there was an absolute lack of knowledge among patients of ACS regarding their disease and its treatment. Although 75% patients knew the exact name of disease but only 37.7% had sufficient knowledge regarding that disease and its available revascularization options. This lack of knowledge directly affects the compliance of patients. Further it was noted that only 30% could correctly answer name of the most effective revascularization option for ACS patients. Likewise, mere 38% patients knew about the relative expensiveness of various revascularization options of ACS. It was also remarkable to note that only a quarter (24.6%) of patients correctly knew about the revascularization option which involves an open heart surgery.

Further, in the current study, it was also found that patients related factors like age, gender, education, residence and economic conditions were associated with lower knowledge of ACS patients regarding their diagnosis as well as the revascularization options. The current study found that increasing age, female gender, lower socio-economic status, illiteracy and rural residence were significantly associated with frequency of insufficient knowledge among ACS patients. Overall, there is a striking need of patient education in order to increase the compliance and decrease the chances of recurrence of condition as well as controlling the severity of disease.

It is critical that healthcare experts regulate their information and support to their patients' health literacy skills. Complicated communicative and decisive abilities are way crucial for successful self-management than fundamental reading and writing skills. Some areas of self-management require health literacy abilities, while others do not, emphasizing the relevance of context.<sup>17</sup> Cardiac rehabilitation is a comprehensive strategy aimed at improving health outcomes of individuals with CVD. Education, exercise training and psychological support are the three main components of cardiac rehabilitation.<sup>18</sup> According to present national and international clinical guidelines, cardiac rehabilitation for individuals with CHD ought to be comprehensive and involve educational, exercise and psychological treatment.<sup>18</sup> Cardiovascular related clinical outcomes

including blood pressure, cholesterol and glucose management are considered as quality markers of practitioner performance and effectiveness in handling CVD, hence increasing patient practitioner communication is critical.<sup>19</sup> The link between patient outcomes and the value of patient practitioner affiliation cannot be overlooked. It is important to provide communication skills training consistently throughout medical school curricula, with continued assistance from a dedicated and qualified staff. In order to reap maximum gains, training opportunities must expand beyond pre-clinical years to residency and ongoing medical education, when communication skills are the central point of patient care.<sup>19</sup>

Introduction of intervention tactics regarding patient has become crucial that can quickly recognize and familiarize to patient's chosen communication style, requirements and expertise in a crowded waiting room. Virtual health coaches, patient portals and interactive films that enable patient shared decision making are offering new prospects to train patients to be knowledgeable and active partners in their care.<sup>20</sup> With the emergency policies in healthcare such as patient centered medical care such as shared decision making, the requirement of innovative and sustainable communication training models has become vital like never before.<sup>21</sup>

Healthcare systems are restructuring to enhance health of patients having chronic diseases or those who are at risk of developing them.<sup>22</sup> The key objective of these health reforms is to empower patients with self-management as well as decision making support so that they become more engaged and educated.<sup>23</sup> Shared decision making (SDM) is a procedure in which both the health practitioner and patient undergo all steps of decision making together, sharing treatment preferences and coming to an agreement on treatment options.<sup>24</sup> It is situated between a paternalistic paradigm, in which health expert has the control in treatment decision making whereas in informed patient model, health experts function is restricted to delivering information and the patient is in charge of decisions regarding treatment.<sup>25</sup>

The current study has some limitations. First of all, the study was quantitative in design containing a questionnaire of only closed ended questions. Secondly, the questionnaire was not validated in any prior study and it was first time used. Therefore, it is possible that underlying factors of insufficiency of knowledge may be missed or misunderstood within the results. Nevertheless, it is first study of its kind conducted on ACS patients in Pakistan. It has come up with the fact of insufficiency of disease related

knowledge among the patients of ACS as well as highlighted many core issues related with the health and compliance of such patients.

## CONCLUSION

Complete and proper knowledge regarding ACS and its available revascularization options among is of critical importance. This study found that majority of patients has insufficient knowledge which will in turn decrease the compliance of patients. It will further increase the risk of recurrence of condition and mortality among such patients. It is the need of hour to formulate strategies so that these patients could be educated and counseled properly. The study suggests that there is a need to develop customized strategies in local perspective to improve awareness in ACS patients as there is proof that educational involvement can improve knowledge and standard of life in people with CVD.

## AUTHORS' CONTRIBUTION

GA, BAS, JAS, KAK and JKS: Concept and design, data acquisition, interpretation, drafting, final approval, and agree to be accountable for all aspects of the work. MH, DK, TS, MJ and AB: Data acquisition, interpretation, drafting, final approval and agree to be accountable for all aspects of the work.

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