

TRENDS IN REFERRAL PATTERNS OF CORONARY ANGIOGRAPHY

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Abstract

OBJECTIVE: This study aimed to document the demographics and trends in referral patterns for coronary angiography in the setting of a tertiary care hospital in Pakistan.

METHODS: The study followed a convenient non-probability sampling design. A non-standardized questionnaire was administered and data analyzed.

RESULTS: An exponential increase was noted in coronary angiography procedures from 2000 to 2006. We interviewed a total of 250 patients out of which 71.4% were males falling in the age group 50-59 years. Only a 3rd (30.8%) of patients were referred from their internist, however more than a 3rd (37.7%) came directly to the cardiologist. 47.7% of patients were from Punjab and 31.4% were from Federal capital. Half of the well-educated patients (50.0%) were well aware of the purpose and side effects of coronary angiography in contrast to only 4.8% of the un educated patients. But more than a 3rd of well-educated patient (40.4%) were not well aware or were unaware (17%) of the exact method for the procedure and its possible side effects despite signing an informed consent.

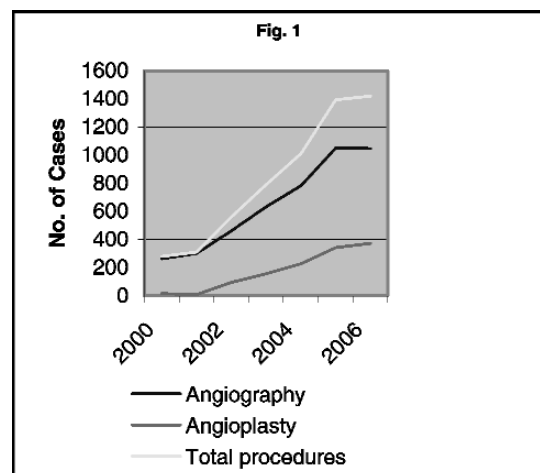
CONCLUSIONS: Diagnostic coronary angiography is rapidly increasing in most tertiary care hospitals in Pakistan and in more than one third of the patients, direct self-referral was the predominant means of referral. In addition, the level of awareness about the purpose and side effect profile of the procedure was directly proportional to the level of education.

Key words: angiography, trends, referral, demographics.

INTRODUCTION

Diagnostic coronary angiography has been rapidly increasing across the globe since the 1990s¹. In the last decade in Pakistan there has also been a significant increase in the number of patients undergoing coronary angiography and/or angioplasty. This trend has also been observed at the Shifa International Hospital (Fig.1). This has primarily been attributed to the widespread availability of cardiac catheterization laboratories both in public and private sectors. However the underlying referral pattern as well as the awareness of patients about the indications and complications of diagnostic coronary angiography is not well documented.

Figure-1. Number of cases of coronary procedures done over last six years in Shifa International Hospital



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Aims and Objectives:

The objectives of the study were as follows:

- To review the demographics of patients presenting for elective coronary angiography.
- To observe the referral patterns of these patients.
- To assess the level of the patient's understanding of the procedure and its complications.

Methods:

1) Study population and Design

This survey was conducted at Shifa International Hospital, Islamabad, during the period May 14 to July 14 2007. Using a population-based, cross-sectional study design, data was collected from patients undergoing elective angiography, via the outpatient department. Both male and females aged 30-90 years, from all provinces and levels of education were eligible. All patients presenting with acute coronary syndrome requiring urgent/ emergent procedure were excluded. The questionnaire was administered by research associates in Urdu or English as discerned appropriate.

2) Sampling Design and Size

A convenient non-probability sampling design was used.

3) Data Collection

Patients were interviewed on the day of procedure in the holding area prior to the procedure. Confidentiality was effectively maintained.

The collected questionnaire was coded and entered in SPSS 12.0 format and analyzed.

Limitations

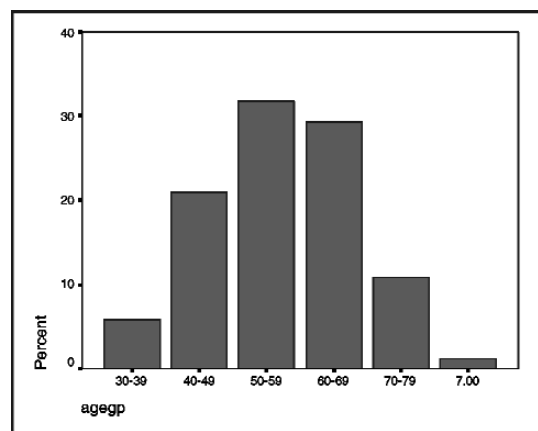
- Our study may not be representative of the perceptions prevalent at a national level.
- Since this is a pilot study, there was no validated questionnaire available.

Results:

We approached a total of 256 patients. Of these 252 cooperated, giving a response rate of 98.5%. 2 forms were considered unusable because they were improperly filled. This gave us a sample size of 250.

AGE: A 3rd (31.8%) of the respondents were middle-aged (50-59 years) with a mean age of 32.37 years. 29.3% belonged to the age group 60-69 years and 20.9% were between 40-49 years. (Fig2).

Figure-2. Histogram of age distribution of the population surveyed.



GENDER: Males were 71.4% and females were 28.6%.

SOURCE OF REFFERAL: 39.8% of our patients were referred from an internist, where as 16.5% and 5.5% heard about angiography from family and friends respectively. 4% caught awareness about angiography from the media. 37.7% patients had other sources of referral, which included direct referral from cardiologist.

DEMOGRAPHICS: 47.7% of the study population belonged to Punjab whereas 31.4% were from federal capital. Only 0.4% were from Baluchistan. Table 1 shows the demographic details of the study population.

DISTANCE FROM ANGIOGRAPHIC FACILITY: Table 2 shows the mean distance patients had to travel for coronary angiography. More than a half of the patients were coming from within 50 miles of the angiographic facility.

Table-1. Demographics of survey population

Region/province	Percent
Punjab	47.7
NWFP	13.4
Islamabad	31.4
Sindh	1.7
Baluchistan	.4
Azad Kashmir	2.1
Total	100.0

Table-2. Distance from angiographic facility

Distance	Percentage of patients
1-50miles	55.2%
51-100miles	15.1%
101-150 miles	18.4%

Table-3. Education level and awareness of procedure and its side effects

Level of awareness for purpose and side effect profile of Level of education angiography

	Unaware	Somewhat aware	Well aware
Uneducated	61.9%	33.3%	4.8%
Primary	31.0%	44.8%	24.1%
Secondary	25.0%	46.4%	28.6%
Matric	24.0%	58.0%	18.0%
Intermediate	5.6%	55.6%	38.9%
Graduate	17.0%	40.4%	42.6%
Postgraduate	13.6%	36.4%	50.0%

LEVEL OF AWARENESS: Table 3 shows the relationship of the level of education and the awareness of the details of the procedure as well as the possible side effects. 50% of the well educated patients were well aware of the purpose of the

procedure but more than a 3rd of even the well educated patients had a suboptimal understanding of the procedure and side effects. Not surprisingly a significant percentage of those who were not well educated were unaware of the indications and side effects of the procedure. This situation occurred despite the fact that all patients were given an informative handout about coronary angiography in the clinic before the procedure as well as verbal explanation by the attending physician.

Discussion:

To our knowledge, this is the first study done in Pakistan, which has analyzed the referral patterns and demographics for elective coronary angiography. Our study revealed that 71.4% of the patients being referred for coronary angiography were males, which may represent a gender bias. In a similar International study by Todd Miller et al. gender differences and temporal changes in the clinical characteristics of patients referred for nuclear stress imaging was considered². Men (17%) were more likely than women (8%) to undergo coronary angiography. Male gender was independently associated with referral for coronary angiography Patient race may also be a determining factor in receiving a referral for coronary angiography, according to a recent study from the Johns Hopkins Bloomberg School of Public Health³. However, once patients receive a referral, there is no significant difference in undergoing the procedure when comparing white and black patients. In our study 47.4% of patients were from Punjab, followed by 31.4% from the Federal Capital. There were only a few patients from Sindh and Baluchistan (1.7% and 0.4 % respectively), which was attributed directly to the location of our angiographic facility. Thomas A et al. reported that, the patients with a cardiology consultation were more likely to obtain a referral for Coronary angiography. African American patients were less likely to have a cardiology consultation, and among patients referred for CA, there was no difference by race in receipt of the procedure⁴. The

appropriateness of using coronary angiography was studied in two major medical centers in Israel⁵. Angiographies were performed inappropriately in 58% of patients: in 56% neither prognostic stratification was performed, nor was comprehensive medical therapy prior to angiography undertaken. Referral to catheterization from an acute care hospital, compared to ambulatory referral, correlated independently with an inappropriate angiogram. We did not look at the appropriateness of the procedure in this study, however our study shows that direct self-referral to a cardiologist still remains the predominant means of appointment for undergoing a coronary angiography. In view of the economic constraints of Pakistani society it would have been more appropriate for these patients to be evaluated by internal medicine physicians initially for appropriate prognostic stratification. Direct access to sub specialist can lead to unnecessary burden to patients and third party payers. Our study also shows a direct relationship between education status and level of awareness about indications and side effects of coronary angiography. Still more than a 3rd of well-educated patients had a level of awareness, which does not fulfill the appropriate criteria for "informed consent". This observation underscores the need for more appropriate and detailed discussions with the patient about the intended procedure.

Conclusion:

Diagnostic coronary angiography procedures are increasing rapidly in Pakistan. Physicians need to do a better job of pre procedure assessment and fulfilling the requirements for informed consent. The role of gatekeeper physicians needs to be strengthened which will limit direct access to sub specialist. However with out improving the literacy rate and proper health education of the masses in our country, this objective will remain un full filled.

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