Growth and Trends in Interventional Cardiology in India

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Abstract
The prevalence of coronary artery disease (CAD) is increasing in India and there is an exponential need for interventional procedures. NIC data shows that there is a steady increase in the number of interventional coronary procedures (16.4%). This increase is a result of increase in number of centres, increasing capabilities of the centres and the interventionists. A total of 177,240 procedures were reported, 215,662 stents were implanted: the DES penetration being 74.5%. Several complex procedures: left main angioplasty (1.3 %), graft angioplasty (1.7%), CTO (~10%) and multivessel PCI (29.8%) were reported in the year 2012. However, there was low utilization of adjunctive agents and devices; GpIIb/IIa antagonist (13.8%), bivalirudin (1.3%), vascular occlusion devices (0.6%), rotablation (0.3%), IVUS (0.3%), FFR (1.1%) and thrombus extraction devices (4.45%). Nearly half of the interventions were performed in context of acute MI (41.6%) and utilized radial approach (45%).

Key Words
Interventional Cardiology
Cath lab
PCI
Stent
DES
AMI
Radial

Background
The growth of coronary interventions in the developed world is stagnating, rather de-growing at the rate of around 5 %. The reason of this stagnation / de-growth is not only increasing cost of interventional material, rationalization of health-care practices particularly appropriate utilization of procedures but probably most importantly success in preventive measures. On the other hand developing countries on the other hand are witnessing a year-on-year, double digit growth.

Current Interventional data in India
The data on coronary interventions in India are largely available through the coronary interventional registry established by the National Interventional Council (NIC), Cardiological Society of India. This data on coronary interventions in India are published periodically. A comprehensive Performa that captures not only the number and types of interventions, but also the prevailing practice patterns in PCI. Questions related to primary PCI, admission and
discharge practices following PCI, and outcome data are collected yearly. The NIC collects data in three ways: A web-based system (www.national interventional council.org), by emailing the completed pdf questionnaire and by postal collection of filled questionnaire. Data from all three sources is collated together and analyzed.

The prevalence of coronary artery disease (CAD) is increasing in India and there is an exponential need for interventional procedures. Across India, there is increase in the number of diagnostic and interventional coronary procedures, interventional centres offering percutaneous coronary interventions (PCI), and interventional cardiologists. In such a scenario, a comprehensive evaluation of the number, nature and distribution of interventional procedures across the country is needed. Herein, we report the coronary interventional data from various centres of India for the year 2011.

A data 369 centres, 539 cardiac catheterization laboratories (1.46 labs per centre) was obtained in year 2012. Twenty one centres reported to have biplane catheterization laboratories and 81 centres had dedicated catheterization laboratories for specific interventions. Facilities for intravascular ultrasound (IVUS), rotablation and fractional flow reserve measurement were reported to be available in 45 (12.2%), 72 (19.5%) and 102 (27.6%) centres, respectively. Overall data on 177,240 PCI procedures was captured in this registry, which reflects a 16.4% growth as compared to the data available for the previous year. (Figure 1) Nearly three fourth (73%) of patients undergoing the procedures were male, 14.2% procedures were done in patients aged less than 40 years and 15.6% were done in patients aged greater than 70 years. Nearly half (41.6%) interventions were in context of AMI (primary PCI 12% and post MI 29.5%). Figure 2 More than half (53.6%) of the diagnostic angiograms were done as day care procedures and rest admit patients at least a day prior. Nearly half (44.2%) of PCI were discharged the following day. Most of the centres (94.6%) reportedly re-used interventional catheters and only 20 centres do not reuse any catheter, balloon or other material.

Out of the 369 centres participating in this registry, 106 (28.7%) centres were performing < 200 PCI per year, while 8 (2.2%) centres were performing > 2000 PCI per year; however these 8 centers accounted for 18% of total volume. (Figure 3)

In the registry out of total 215, 662 stents deployed, 160668 (74.5%) are DES. (Figure 4) More than two third of patients undergoing PCI had single vessel disease (67.2%). Left main angioplasty was carried out in 2304 patients (1.3 %) and graft angioplasty in 2977 pts (1.7%). Overall, 17,546 CTO ( 185 Retrograde approach), and 52,817 multivessel PCI was reported. Nearly half the procedures (45%) were reported performed via radial route. There was a low utilization of adjunctive therapies and procedures. GpIIb/IIa antagonist use reported in 24,464 (13.8%), bivalirudin in 2381 (1.3%), vascular occlusion devices in 1020 (0.6%), patients, rotablation in 478(0.3%), IVUS in 545 (0.3%), FFR in 1962 (1.1%) and thrombus extraction devices in 7889 (4.45%) procedures or 37% of all primary PCI performed. The reported in-hospital mortality for the PCI was 0.91%.

**Discussion**
Coronary intervention procedure in the developed world is stagnating. India on the other hand is witnessing a year-on-year, double digit growth (16.4% in year 2012). An aging population, shifting disease pattern, increased health awareness, growing private hospital sector, increasing local government support and expenditure but most importantly a growing middle class has all contributed to this phenomenal growth. Part of the increase is due to a trend of smaller centres coming up across India and medium volume centres increasing their volumes and reporting their data. The increasing PCI capabilities are also perhaps reflected in more proportion of interventions are performed in extreme age groups; younger <40 years and older > 70 years; left main angioplasty (1.3 %), graft angioplasty (1.7%), CTO (≈10%) and multivessel PCI (29.8%) and high DES penetration (74.5%). An important concern for coronary interventions is the quality of the procedure. The main reason may be trying to save cost of the procedure which is perhaps reflected in several practices followed in the country: More than half (53.6%) of the diagnostic angiograms were done as day care procedures, nearly half (44.2%) of PCI were discharged the following day, high reuse of interventional hardware (95% of centres), and low utilization of adjunctive therapies and procedures like GpIIb/IIa antagonist (13.8%), bivalirudin (1.3%), vascular occlusion devices (0.6%), rotablation (0.3%), IVUS (0.3%), FFR (1.1%) and thrombus extraction devices (4.45%) of the procedures. Other studies have also made a similar observation. An interesting finding of the registry was use of radial approach perhaps reflective of the need for early discharge (and thus save the cost of procedure). Another interesting finding is that nearly 50% of all procedures in India are in context of acute MI. This may also reflect the practice of Indian middle class which cannot afford to splurge but will spend when it feels is absolutely necessary (heart attach being one such condition).

Summary
Coronary interventions are growing in India but quality remains a concern.
References


