

Atrial Fibrillation: Paradigm Shift in Concept Leading to Change in Treatment Strategies in the Developing World

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Mini Review

Atrial Fibrillation (AF) is the most common significant arrhythmia observed in clinical setting, the incidence of which increases with age. The life expectancy in the developing countries has increased considerably in the last two decades due to advancement in health care delivery systems. The increased life expectancy of the population brings in its array myriad of problems of non communicable diseases like Hypertension, Diabetes and obesity which increases the prevalence of AF. The life time risk of developing AF after the age of forty was found to be approximately 25% in the Framingham Heart Study [1] which collaborated with the findings of Rotterdam Study in which the lifetime risk of AF at the age of 55 years was 23.8% in men and 22.2% in women [2]. However no such studies good sample size to predict the age prediction of AF in the developing world is yet to be undertaken.

The fibrillating heart in developing countries is mainly due to associated rheumatic valvular heart disease, or untreated atrial septal defects, mostly recognized late due to lack of adequate health professionals in the rural areas. This lead to the finding of a noncompliant small heart with permanent AF or Long standing persistent AF, where the decision is not to restore or maintain sinus rhythm by any means, including catheter or surgical ablation. However such a group of population in the developing world is offered to control the heart rate with highest tolerated dose of cardio selective betablockers or calcium channel blockers like verapamil and diltiazem which also takes care of their problem of chronic heart failure.

The author and his team had undertaken a study where Intravenous Amiodarone 3 mg/kg was used pre-cardiopulmonary bypass after induction of anesthesia, in patients with increased Left Atrium (LA) size in patients with Valvular heart disease electively posted for valve

replacement surgery. In this study it was found that 3 mg intravenous amiodarone not only restored sinus rhythm, but in selective cases reduce the energy requirement for internal defibrillation in the post bypass period, however the duration of pacing requirement in the post bypass period was slightly high [3]. In the context of economic constraints in developing countries rate control strategy is safe and cost effective which was evident from the results of the AFFIRM and the RACE trails in 2002 which highlighted that rate control was not inferior to rhythm control with medication (cardio selective betablockers and Calcium channel blockers like diltiazem and verapamil) and that rate control may have an advantage over rhythm control. So this rate control strategy is the preferred strategy in treating majority of the AF cases in the developing world.

There are two widely accepted mechanisms involved in the genesis of AF, the multiple wavelets Hypothesis and the Recent Focal trigger Hypothesis. The protagonists of the former hypothesis advocated the Cox maze procedure as the gold standard on the basis on the concept that AF needs a critical number of circulating wavelets, each of which requires a critical mass of atrial tissue, which can be surgically ablated by multiple through and through surgical incisions by interrupting all macro re-entry circuits [4]. The focal trigger hypothesis has achieved a major break though by advocating Pulmonary valve (PV) isolation and in the recent days PV isolation has shifted more proximally into the LA resulting in PV antral isolation, which is the standard treatment only in the subset of patients with Paroxysmal AF [5] and therefore its utility is limited in the clinical profile of patients encountered in the developing world where the AF is of rheumatic valvular origin and is of longstanding and persistent variety probably due to delayed detection. The anti-coagulation is done as per the CHA2DS2-VASc Scoring and the bleeding risk assessed as per Bleeding Risk (HAS-BLED) Scoring (Table 1).

CHA2DS2-VASc	Score	HAS-BLED	Score
Congestive heart failure	1	Hypertension (systolic blood pressure >160 mm Hg)	1
Hypertension	1	Abnormal renal and liver function* (1 point each)	1 or 2
Age ≥ 75 y	2	Stroke	1
Diabetes mellitus	1	Bleeding tendency/predisposition	1
Stroke/TIA/TE	2	Labile INRs (if on warfarin)	1
Vascular disease (prior MI, PAD, or aortic plaque)	1	Elderly (eg, age>65 y)	1
		Drugs or alcohol (1 point each)	1 or 2

Aged 65 to 74 y	1		
Sex category (i.e. female sex)	1		
Maximum score	9	Maximum score	9

Table 1: Assessment of Stroke (CHA2DS2-VASc) and Bleeding Risk (HAS-BLED) in Atrial Fibrillation Patients.

The role of the care manager is highlighted in several studies in the chronic care model developed by Wagener et al. and Innovative Care for Chronic conditions developed by W.H.O. which highlights empowerment of patients, the patients being more informed and they seem to become more active in managing their health [6]. This is because in case of chronic diseases, the patient has to live with the disease, with efforts being directed to improve the quality of the life of the patients in the presence of the chronic disease. In the context of AF such a concept is emerging in the developing world.

The associated chronic comorbid conditions like Hypertension, Diabetes, Old Age, chronic congestive heart failure, history of stroke and transient ischemic attack, Vascular disease and female gender influence the prevalence of AF which has been used to calculate the scoring system for initiation of anticoagulation in AF [7].

The improvement in developing countries conditions and the impulse of sportive activities can influence the occurrence and the management of AF; this is because of the undiagnosed genetic channelopathies, which are not routinely screened because of the lack of genetic screening back up infrastructure in the developing countries [8]. Exertional sports in patient with valvular heart disease can incite AF, the presentation of which is challenging in the context of the presence of associated ion channel defects which remain unscreened.

The developing world need to find a strategy by conducting trails involving their encountered profile of patients as the guidelines of the

ACC, AHA, APHRS and STS did not involve patient profile, which is unique to the developing world in the scenario of increased prevalence of rheumatic valvular heart disease and adding to the complication delayed detection of the pathology due to limited healthcare delivery systems and poor economic infrastructure.

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