Medical and Research Publications
International Open Access

Review Article **Journal of MAR Case Reports (Volume 6 Issue 1)**

Recent Advances in Interventional Cardiology. A Mini Review

Precious Pedersen [1], Oluwasegun Afolabi Shoewu [2], Ammara Ghaffar [3], Muhammad Sohail Mushtaq[4], Damayanthi C Kulasena [5], Keron Akintola Ayodele Blair [6], Tai Donovan[7], Sagal Yusuf [8], Nadeem Iqbal [9]*, Anab Rehan Taseer [10].

1. Windsor University School of Medicine.

2. Olabisi Onabanjo College of Health Sciences, Ogun State University.

3. King Edward Medical University.

4. (ELAM) Latin American School of Medicine Cuba.

5. Avalon University School of Medicine, Curaco.

6. American International School of Medicine, Georgetown Guyana.

7. Windsor University School of Medicine.

8. Windsor University School of Medicine.

9. PKLI, Lahore.

10. Department of Pulmonology, Lady Reading Hospital Peshawar.

Corresponding Author: Nadeem Iqbal, Dept of Urology and Kidney Transplant, Pakistan Kidney and Liver Institute Lahore, Pakistan.

Received Date: September 08, 2022

Published Date: September 20, 2022

Abstract

During last year world was trying to come out of the COVID 19 saga. Many clinical trials with interesting outcomes having the potential to modify and enhance the current practice and future guidelines were presented at major international meetings. We tried to summarise interesting developments in cardiology researches over last one year that can have major impact on moulding cardiology practices in future.

Key Words

Acute coronary syndrome; Antiplatelets; Cardiology; Coronary revascularisation; Heart failure.

Introduction

During last year world was trying to come out of the COVID 19 saga. Many clinical trials with interesting outcomes having the potential to modify and enhance the current practice and future guidelines were presented at major international meetings including the European Society of Cardiology (ESC), Transcatheter Cardiovascular Therapeutics (TCT), American Heart Association (AHA), European Heart Rhythm Association (EHRA), American College of Cardiology (ACC). In this article we have tried to summarise the major studies across the spectrum of cardiovascular subspecialties including acute coronary syndromes (ACS), interventional cardiology.

Methods

We searched PubMed, and Medline database publications and results of clinical trials presented at major international cardiology conferences during the last year using acute coronary syndrome, interventional cardiology and heart failure. The publications included were special communications, reviews, books, and research presentations and studies regarding the subject matter over the last year.

Discussion

COVID-19 put the whole global healthcare systems on strain. In a vey crucial recent analysis of large cohort of patients with STEMI (230 COVID-19 positive, 495 suspected COVID-19 positive and 460 controls) showed that patients who suffered from COVID-19 were more at risk of cardiogenic shock and cardiac arrest [1]. It was found that, 78% of patients with COVID-19 did not undergo angiography, resulting in a higher mortality vs. patients with COVID-19 who did (48% vs. 28%; p = 0.006) . This analysis underscored the fact that it is a high-risk group of patients who were underinvestigated but benefit (when appropriate) from urgent revascularisation.

There is evidence for benefits of reducing door to balloon times to improve outcomes in STEMI, but variuos elements can cause delay (especially transfers, activation of the cardiac catheterisation lab and diagnostic confirmations in ambiguous cases). A retrospective study found that training emergency medical service (EMS) staff to utilise mobile phone app with GPS tracking decreased mean door to balloon time from 67.8 to 56.3 min with significant P-value [2]. However prospective randomised multicentre evaluation has not been done and is much needed to prove the benefits on larger scale.

In yet another good study, the beneficial outcomes of a second-generation robotic PCI system was investigated in the PRECISION GRX (Multicenter Post-Market Registry for the Evaluation of the CorPath GRX System Effectiveness in Percutaneous Coronary Interventions) trial [3]. There were two co-primary endpoints ; clinical success, defined by intervention resulting in less than 30% residual stenosis in the absence of a major adverse cardiac event (MACE), and technical success, signified by clinical success without the need for manual assistance or conversion. Clinical success rate was observed in 98.2% of all lesions. Technical success was achieved in 89.8% of lesions. The observations of this trial were highly encouraging and will likely pave way for further research to help reduce radiation exposure and orthopaedic complaints amongst interventional cardiologists.

Patient should have knowledge about the indications for their PCI, when it was performed, and the type and size of stent usedIn a study,it was observed that patients who had undergone previous PCI [4], approximately 17% of these were able to provide the correct information about their previous interventions, showing poor information retention. It was further noted that 74.5% of the respondents would be happy to have these informations being stored in their mobile phones. Thus, an app or file comprising of the relevant data would be of great use in future to store the discharge information which can be helpful in future follow ups.

One interesting meta-analysis comapred the value of PCI plus medical therapy vs. medical therapy alone for stable CAD a PCI strategy was linked with a lower risk of cardiac death and spontaneous MI

but no significant difference in all-cause mortality [5]. Eventhough ,their findings were optimistic, conclusions should be taken cautiously as the meta-analysis included studies dating back to 1979 (when medical therapy was less than optimal in those years).

It is a norm that around 50% of vein grafts fail within 10 years of CABG procedure. To solve the dilema, an interesting investigative study was conducted. Which aimed to investigate whether a venous external support (VEST) device made with a braided weave of cobalt-chromium applied over the vein grafts to provide permanent augmentation could mitigate intimal hyperplasia, which can be one of the possible mechanisms for early graft failure [6]. A total of 224 patients undergoing CABG with two vein grafts were enrolled, each patient having one vein graft randomised to VEST device support and one vein graft serving as a control. It was anticipated early graft failure at 1 year would occur in 13%, but in fact 42% of vein grafts had occluded. VEST support was not associated with any reduction in the primary endpoint of intimal hyperplasia area (mean 5.11 vs. 5.79 mm2; p = 0.072), although conclusions were confounded by the high early graft failure rate.

Then coming to advances in stents, the utilization of ultrathin strut biodegradable-polymer sirolimus-eluting stent (BP-SES) in STEMI was investigated in the BIOSTEMI trial [7] (Biodegradable Polymer Sirolimus-Eluting Stents Versus Durable Polymer EverolimusEluting Stents in Patients With STEMI) which randomised 1300 patients to BP-SES vs. a durable polymer everolimus-eluting stent (DP-EES). The primary endpoint was target lesion failure (TLF), a composite of cardiac death, target vessel MI and clinically indicated target lesion revascularisation (TLR). Use of BP-SES was associated with significant reduction in target lesion failure (TLF) at 2 years, although there were no significant differences in single endpoints of cardiac death, target vessel MI or definite stent thrombosis.Further studies are needed to know the potential benefits.

The aetiology of a subset of classical STEMIs (particularly in younger patients) may be ascribed to plaque erosion rather than plaque rupture and theoretically following thrombectomy such patients might not require culprit vessel stenting. The EROSION III trial (OCT- vs Angio-based Reperfusion Strategy for STEMI) randomised 246 patients with STEMI, after initial angiography and thrombectomy if required, to optical coherence tomography (OCT) guidance with subsequent mechanism-based management vs. standard care based on angiography alone [8]. OCT guidance was associated with a reduction in need for stent implantation. For those deemed as having plaque erosion (29%), OCT guidance was linked with a significant increase in those being managed conservatively (86% vs. 14%). This is an interesting study but still needs a larger scale study powered for MACE endpoints before such an approach can be definitively recommended in cardiology clinical practice.

Conclusion

In this review paper many interesting advances in clinical cardiology researches and trials over the last year were highlighted and summarized. Many of these have potential to guide clinical practice and impact the modification of guideline.Other studies need further large scale trials to guide future course of cardiology researches.

References

1. Garcia S, Dehghani P, Grines C, et al. Initial findings from the North American COVID-19 myocardial infarction registry. J Am Coll Cardiol. 2021;77(16): 1994–2003

2. Abrahim C, Capitana A, Stanaway N, et al. Reducing EMS-to-balloon time—there's an app for that. J Am Coll Cardiol. 2021;77(18_suppl_2):16.

3. Mahmud E. Safety and efficacy of the second generation robotic-assisted system for percutaneous coronary intervention: final results of the multicenter PRECISION GRX study. Presented at SCAI 2021. April 29, 2021.

4. Safirstein JG, Kowalski M, Chiu S, et al. Knowledge retention after percutaneous coronary intervention. J Am Coll Cardiol. 2021;77(18_suppl_1):968.

5. Naverese EP, Lansky AJ, Kereiakes DJ, et al. Cardiac mortality in patients randomised to elective coronary revascularisation plus medical therapy or medical therapy alone: a systematic review and meta-analysis. Eur Heart J. 2021;42(45):4638–51.

6. Puskas J. Efficacy and safety of an external support device for saphenous vein coronary bypass grafts: the VEST trial. Presented at AHA 2021, 13 Nov 2021.

7. Pilgrim T, Muller O, Heg D, et al. Biodegradable- vs durable-polymer drug-eluting stents for STEMI: final 2-year outcomes of the BIOSTEMI trial. J Am Coll Cardiol Intv. 2021;14:639–48

8. Jia H, Dai J, He L, Xu Y, Shi Y, Zhao L, Sun Z, Liu Y, Weng Z, Feng X, Zhang D, Chen T, Zhang X, Li L, Xu Y, Wu Y, Yang Y, Wang C, Li L, Li J, Hou J, Liu B, Mintz GS, Yu B. EROSION III: A multicenter RCT of OCT-guided reperfusion in STEMI with early infarct artery patency. JACC Cardiovasc Interv. 2022 Mar 23:S1936-8798(22)00420-4.