

REVIEW ARTICLE—ASNC INTERNATIONAL SESSION

The Challenges of Developing Nuclear Cardiology in the Developing World: A Brief Brainstorm

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Abstract

This brief review intends to highlight how heterogeneous the world is regarding cardiovascular mortality and overall use of nuclear cardiology, especially in the developing world where mortality remains high. This was one of the important topics discussed during ASNC2017 in Kansas City, USA. Despite the challenges, appropriate use of nuclear cardiology could be helpful to estimate risk and guide patient management, bringing opportunities to the developing world. In addition, we briefly list key issues which could serve as a guide to foster the development of nuclear cardiology, including the imperative need to avoid unnecessary revascularizations, which might be even more challenging with increased use of non-invasive diagnosis of disease by computed tomography.

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Cardiovascular disease mortality has progressively decreased in high income countries. Nevertheless this same phenomenon has not been observed in low to mid income countries, the so called developing world. High income countries are seeing aging of the population. A phenomenon that clearly demonstrates how successful these countries have been in terms of reducing mortality, specially related to the leading cause of mortality in the western world which is cardiovascular disease. Certainly a combination between preventive measurements and the use of technology to diagnose and risk stratify disease should have played an important role in the observed decreased mortality. Unfortunately, according to the world health organization (WHO) many parts of the world are still observing the opposite, an increasing mortality and an excess of premature deaths, those that occur before the age 70 (1).

When we look at nuclear cardiology, on the most widely used technique for risk stratification, we observe that there is, in general, low utilization where mortality is high and the opposite where mortality is low (2). This does not mean directly that the use of nuclear cardiology decreases mortality

but could serve as one of the markers on how investments in health care can lead to decreased mortality and increased longevity, probably due to a combination of prevention associated with management guided by one or another form of technology.

What is needed to develop and foster the growth of nuclear cardiology?

Regarding the practice and utilization of nuclear cardiology we can say that the world is heterogeneous in many different forms, varying from the degree of training of personal, financial resources to invest in technology and level of information of referring physicians regarding the clinical value of different diagnostic modalities. Table 1 summarizes some aspects that should be taken into account considering the challenges and the vast opportunities to develop nuclear cardiology worldwide, especially in the developing world where mortality remains high.

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Table 1 Key issues to develop nuclear cardiology (NC)

- Professionals need to be useful and deliver quality work
- Professionals should keep up to date with current knowledge
- Participate in cardiology meetings and clinical discussions
- Explore opportunities to participate in regional scientific meetings and deliver talks
- Build useful and friendly relationship with referring physicians
- Know the strenghts and weaknessess of NC
- Explore scientific cooperation with other specialities/institutions
- Explore opportunities to do research and publish
- If possible be proactive helping healthcare providers (public/private) with protocols

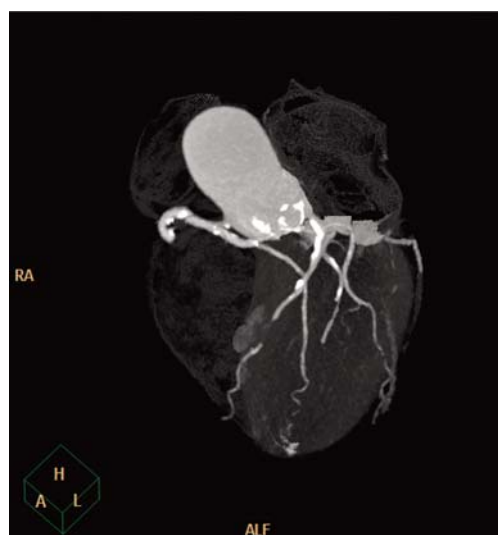


Fig. 1A

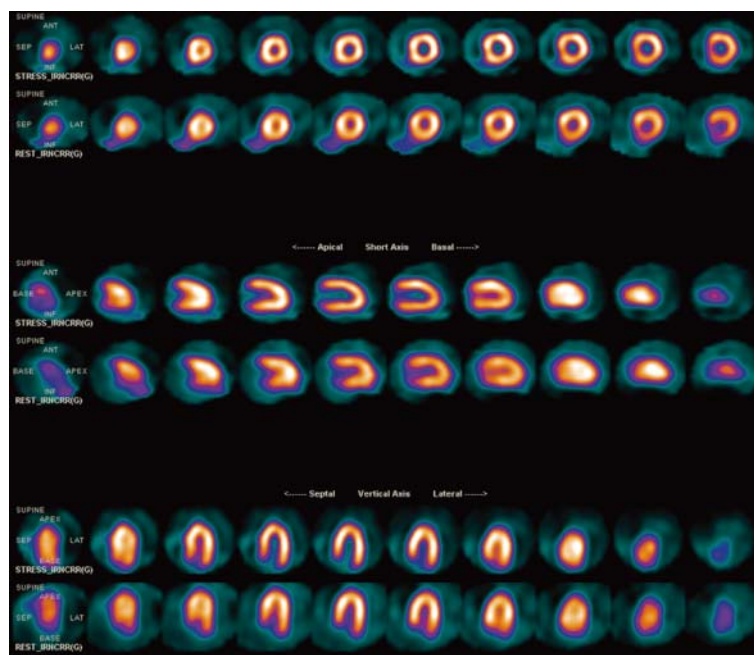


Fig. 1B

Fig. 1A corresponds to a CCTA study performed as a first test to evaluate suspected CAD in a 67 yo female, with intermediate Framingham risk score who complained of fatigue on exertion. These test demonstrated a series of lesions in the coronaries of questionable clinical significance. The patient was then referred to nuclear cardiology. MPI shown on figure Fig. 1B demonstrated normal perfusion and normal function in a patient that exercised at high workload. Management consisted of guideline directed optimal medical therapy as a form of secondary prevention and neither invasive studies nor revascularization were performed on this patient who will be clinically followed. (Vitola JV-Quanta Diagnostico e Terapia, Curitiba-Brazil)

How is nuclear cardiology positioned with recent growth in CCTA utilization?

In the past several years, the use of coronary computed tomography angiography (CCTA) has grown tremendously in many different parts of the world. There is some evidence in the literature that an anatomic evaluation approach to investigate suspected coronary artery disease (CAD) may lead to an increased number of revascularizations without a corresponding correlation with decreased mortality (3) Demonstration of CAD by CCTA brings in fact some interesting opportunities: [1] to start secondary prevention once the presence of CAD is objectively confirmed and [2] an opportunity for a step wise approach to the evaluation of CAD with a functional test such as myocardial perfusion imaging (MPI) as a way to re-estratify by identifying the presence or

not of myocardial ischemia which is a powerful and well stablished way to stratify risk and guide management and can serve as a filter for more interventional procedures. Fig. 1A and 1B exemplify such a case.

Conclusion

Despite the challenges present today to develop nuclear cardiology in many countries, the aspects on table 1 can serve as a guide to successful development of this technology in many parts of the world. The significant problem of mortality due to CAD, especially the premature deaths that still occur in excess in the developing world bring to nuclear cardiology an opportunity to be part of the solution to better stratify risk of patients and guide management. The growth of CCTA utilization in many parts of the world is another opportunity

for nuclear cardiology, bringing to the patient's evaluation the so needed functional information necessary to guide treatment and to help the cardiologist to make important decisions of whether to maintain the patient in clinical management, as shown on figures 1A and 1B or to send the patient to revascularization.

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Conflicts of interest

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References

1. World Health Organization. http://www.who.int/cardiovascular_diseases/en/. Accessed in May 2018
2. Vitola JV, Shaw LJ, Allam AH, et al. Assessing the need for nuclear cardiology and other advanced cardiac imaging modalities in the developing world. J Nucl Cardiol 2009; 16: 956-61.
3. Douglas PS, Hoffmann U, Patel MR, et al. Outcomes of anatomical versus functional testing for coronary artery disease. N Engl J Med 2015; 372: 1291-300.