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The new American Heart Association algorithm: is it progress?

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Abstract

The new 2014 American College of Cardiology (ACC) and American Heart Association (AHA) guideline for the perioperative cardiovascular evaluation and management of patients undergoing non-cardiac surgery was published in 2014.[1]

There are a number of fundamental changes to this guideline, of which the practising anaesthetist should be aware. Furthermore, the changes in the guideline give an idea of the change in the philosophy of cardiovascular risk stratification and risk reduction in the USA. This paper reviews the changes to the algorithm, and the publications that resulted in these recommendations.

Keywords: AHA algorithm, ACC, guideline, non-cardiac surgery, acute coronary syndromes

The fundamental changes to the 2014 American College of Cardiology and American Heart Association algorithm

There are seven fundamental changes to the 2014 ACC/AHA algorithm. These changes are dealt with sequentially, as they are presented in the pathway of the guideline.

Firstly, the identification of unstable cardiovascular conditions has changed in terminology from a more inclusion "active cardiac conditions" to more selective "acute coronary syndromes".[1] The implications are that the new algorithm now places more emphasis on coronary artery disease[1] at the expense of cardiac failure, valvular heart disease and arrhythmias.[2] This is an important observation as we know that cardiac failure, valvular heart disease and significant arrhythmias are associated with increased cardiovascular risk. The algorithm that is now proposed should not be considered as an acceptable risk stratification approach to patients with cardiac failure, valvular heart disease and arrhythmias.

The second change is that the guideline executive committee has removed surgical grading from the risk stratification. They have now integrated "surgical risk" into the recommended preoperative risk stratification model.[2] Previously, low-risk surgery was essentially "a ticket to surgery",[2] but in the new algorithm, emphasis is placed on the predicted risk of major adverse cardiac events (MACE), irrespective of the surgical risk category. The implication is that low-risk surgery should undergo the same scrutiny for MACE risk as other surgeries. However, it must be remembered that the surgical risk is now built into the preoperative risk stratification models,[3-5] and as such, only a very small proportion of patients undergoing low-risk surgery will be flagged as being at increased cardiac risk.

The third change is that the ACC and AHA now consider two cardiovascular risk stratification models to be acceptable in the determination of cardiovascular risk in addition to Lee's Revised Cardiac Risk Index; namely Gupta's model and the National Surgical Quality Improvement Program (NSQIP) model.[4,5] It is important to note that neither the Gupta model nor the NSQIP model have been validated outside of the USA.[4,5] The implication is that these models provide an acceptable estimate of cardiovascular risk within the USA population, and this is almost certainly driven by the more discriminatory surgical risk stratification built into these models. There is now indecision on what is the gold standard for preoperative cardiovascular risk stratification, and it can be assumed that the executive guidelines committee now believes that a more discriminating model is necessary. It would be reasonable to assume that the most discriminatory model for cardiovascular risk is deemed to be most desirable, and if we generated a locally relevant and discriminatory model for MACE in South Africa, it would be reasonable to adopt it for clinical practice.

The fourth change is that the ACC and AHA has now defined elevated cardiac risk as anyone with a risk of MACE > 1%. There is no further risk stratification once a patient is deemed to be at increased risk by this definition.[1] The need for further noninvasive testing is now left to the clinician's discretion once a patient has a MACE risk of > 1%.[1] The clinician needs to decide to make a call as to whether or not further testing will impact on decision-making and the management of perioperative care.

The fifth change is that pharmacological stress testing is now recommended, should further testing be clinically indicated.[1] This may be the result of the tighter focus of the algorithm on coronary artery disease now, and the suggestion that pharmacological stress testing may be a trend with respect to better performance for diagnosing and managing coronary artery disease.[6]

The sixth change is that positive pharmacological stress tests should be followed with a consideration for coronary revascularisation. This is strong support for the fact that in patients in whom coronary revascularisation is indicated prior to elective noncardiac surgery, there is evidence to suggest that they fare better if they receive preoperative coronary revascularisation, particularly in unprotected left main stem disease.[7]

The seventh fundamental change is that heart rate control has now been removed from the guidelines as a recommended routine risk reduction procedure in patients at increased risk.[1] This change acknowledges the controversy surrounding rate control with a beta blockade, and the associated positive and negative outcomes.[8]

Conclusion

The new 2014 ACC and AHA guideline has a more focused approach to coronary artery disease now.[1] The guideline suggests that all patients with a MACE risk of > 1% require an individualised approach to risk stratification and risk reduction.

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