Routine tests should be challenged in cardiology

See page 162 for the article to which this Editorial refers

The need for routine diagnostic tests and procedures needs to be challenged in medical practice, because of continuous pressure to reduce the costs of health care systems. If costs can be minimized by avoidance of routine tests, more sources can perhaps be directed to new advanced diagnostic and therapeutic procedures. This challenge is important particularly in cardiology, because while new diagnostic tests and therapeutic interventions develop rapidly, many institutions and hospitals cannot invest in expensive devices or personnel needed to perform the new tests and interventions.

There are many diagnostic tests and procedures in cardiology, such as routine exercise tests, electrocardiographic examinations, Holter recordings, pacemaker check-ups etc., that could be challenged. In addition to costs, some of the tests may be uncomfortable for patients. Relatively little evidence-based data are available on the benefits of various routine tests. These tests are often recommended by the manufactures of the therapeutic devices or by some old tradition that is not based on scientific evidence.

The study of Brunn et al. has challenged the routine postoperative testing of the defibrillation threshold of implantable cardioverter defibrillators[1]. A large retrospective study shows that the clinical information obtained by routine defibrillation threshold tests is limited. Routine defibrillation threshold measurements provided new information that resulted in therapeutic intervention only in one out of 1000 patients. Most of the cases with high defibrillation thresholds could be predicted by careful clinical evaluation of the patients. Notably, unexpectedly high defibrillation thresholds were obtained in none of the patients who had biphasic implantable cardioverter defibrillators. Frequent problems of high defibrillation thresholds and the need for routine tests were based on the time when monophasic waveforms were used in implantable cardioverter defibrillators. The authors correctly point out that routine postoperative defibrillation thresholds may no longer be needed, because the test itself is unpleasant for the patient and may not be free of complications. However, if there is a clinical suspicion of implantable cardioverter defibrillator dysfunction, e.g. a low safety margin in the intra-operative defibrillation threshold testing or pocket haematoma etc., a repeated test is recommended. The findings and conclusions of this study concur with the results of a smaller prospective, randomized study, which showed that there were no differences in complications and rates of unanticipated hospital admissions between the patients with and without routine defibrillation threshold testing[2]. Of particular note, elimination of routine defibrillation thresholds resulted in savings of $1800/patient after 6 months[2].

The study of Brunn et al.[1] also confirms the previous concept that antiarrhythmic drugs may increase the defibrillation threshold. The authors recommend that the defibrillation threshold should always be tested after the initiation of class I or class III antiarrhythmic drugs. This recommendation is well based on the observations of this and other studies[3], but I have some concerns that re-testing of the defibrillation threshold after the initiation of antiarrhythmic drugs is not a common practice in all centres. Antiarrhythmic drugs are quite frequently used in implantable cardioverter defibrillator patients, and may also be initiated by experts who are not dedicated to electrophysiology and who are not aware of the potential interactions between the drugs and implantable cardioverter defibrillators. It might be interesting to perform a survey that estimates how often the defibrillation threshold has been tested in clinical practice after the initiation of antiarrhythmic drugs. Of particular note, antiarrhythmic drugs did not cause a failure to defibrillate in any of the patients with biphasic implantable cardioverter defibrillators, which are currently used in all modern devices. As the authors correctly point out, a prospective study would be needed to resolve the question of when the defibrillation threshold should really be re-tested after the initiation of commonly used antiarrhythmic drugs. It may well be that routine tests are not needed in the majority of the patients, and the clinicians should be able to recognize those particular cases, e.g. the patients with a low safety margin, when re-testing is mandatory.

It is not certain whether the results and recommendations of these studies[1,2] can be generalized to common practice in all hospitals, where implantable cardioverter defibrillators are implanted, because the studies have been performed in experienced centres with a high volume of implantable cardioverter defibrillator patients. In the study of Brunn et al.[1] the implantable cardioverter defibrillator failed to defibrillate the patient in six cases, which may be fatal for the patient who has received an expensive life-saving
device. Experienced cardiologists could predict most of these failures in advance. Implantable cardioverter defibrillator patients may also see physicians or cardiologists who are not experienced in the potential problems of implantable cardioverter defibrillators. We do not know how easily these physicians can recognize clinically the potential dysfunction. Continuous training and education of physicians to detect all potential sources of implantable cardioverter defibrillator dysfunction will be important to avoid implantable cardioverter defibrillator failures.

Much evidence-based information has been obtained from clinical trials in cardiology in the 1990s. It may also be important to direct research to some commonly accepted concepts, which are based on old traditions but not on evidence-based medicine. This type of research may help in directing limited sources to areas where cardiology is at its best.

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References

Patients with ischaemic heart disease and severe left ventricular dysfunction — who should not be revascularized?

See page 125 for the article to which this Editorial refers

Background

Within the population of patients with congestive heart failure due to ischaemic heart disease, a substantial proportion are likely to benefit from revascularization. There are numerous data supporting the use of coronary artery bypass grafting (CABG) in these patients. In the randomized trials comparing medical and surgical treatment, the CABG-related survival benefit has been found to be inversely related to the pre-operative left ventricular function; that is larger survival benefits were obtained in patients with impaired left ventricular function. In these trials few patients with an ejection fraction of less than 40% were included. Patients with an ejection fraction below this level are also likely to benefit from surgery. It is possible, however, that there is a critical lower limit for the ejection fraction beyond which the surgical risk will exceed the gain achieved by surgery.

The mechanism of the beneficial effect of CABG in patients with severe left ventricular dysfunction is still unclear. One widely accepted hypothesis is that the results from improved blood flow to hypoperfused and dysfunctional regions of the myocardium show an improvement in function after revascularization[1,2]. Many authors, using positron emission tomography[3–6], single photon emission tomography[1–3] and dobutamine echocardiography[1–3,7], have focused on the identification of dysfunctional but viable myocardium and its correlation to outcome.

In this issue, Pasquet and co-workers[8] present a new concept for pre-operative evaluation of these patients. In their study, an improvement in the global left ventricular ejection fraction in response to low-dose dobutamine was the most important predictor of improvement in the ejection fraction after revascularization. A number of considerations must be taken into account when interpreting the results of these studies, including the study of Pasquet et al.[8]

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