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ASPECTS OF ANTITHROMBOTIC THERAPY IN PATIENTS WITH ATRIAL FIBRILLATION AND CORONARY DISEASE (review)

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Annotation: Coronary artery disease (CAD) is the most common cardiovascular disease, while atrial fibrillation (AF) is the most frequent type of cardiac arrhythmia. These pathologies possess common risk factors, such as hypertension, diabetes mellitus, sleep apnea, obesity and smoking. Moreover, inflammation is essential for the development of both diseases. The prevalence of CAD in patients with AF ranges from 17 to 46.5%, while the prevalence of AF in patients with CAD is relatively low and is estimated to be only 0.2–5%. AF is a known factor of unfavorable short-term and long-term prognosis in patients with acute myocardial infarction (AMI) and is associated with a significant increase in overall mortality. Cardiac arrhythmias are not infrequent after cardiac surgery and occur in approximately 30–40% of patients undergoing coronary artery bypass surgery. It is estimated that 5–15% of patients with AF will ever require percutaneous coronary intervention and, subsequently, triple antithrombotic therapy with aspirin, clopidogrel or ticagrelor and oral anticoagulant. This demands a very careful consideration of balanced antithrombotic therapy, taking into account the high risk of bleeding, the risk of stroke and stent thrombosis with subsequent acute coronary syndrome. The concomitant administration of oral anticoagulants with antiplatelet drugs, and, particularly, the triple therapy, significantly increases the absolute risk of serious bleeding. In addition, heavy bleeding is associated with a five-fold increase in the risk of an adverse outcome after acute coronary syndrome. The co-presence of AF and CAD worsens the prognosis even in patients undergoing thorough treatment.

Keywords: coronary artery disease; atrial fibrillation; prevention; antithrombotic therapy.

Relevance

Atrial fibrillation is a cardiac arrhythmia that increases the risk of thrombus formation in blood vessels. Ischemic heart disease (IHD), on the other hand, is associated with narrowing or blockage of the coronary arteries, which impairs oxygen supply to the heart and can lead to myocardial cell death. The coexistence of both conditions significantly affects the overall health status of the patient.

Aim of the Study

To examine aspects of antiplatelet therapy in patients with atrial fibrillation and ischemic heart disease.

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Research Results and Analysis

Ischemic heart disease (IHD) remains the most commonly diagnosed cardiovascular disorder globally [1], while atrial fibrillation (AF) represents the leading type of cardiac rhythm abnormality [2]. Among women, the occurrence of angina shows a marked increase with age—from 5–7% in those aged 45–64 to 10–12% between 65–84 years. A similar trend is seen in men, with prevalence rising from 4–7% to 12–14% across the same age ranges [3]. By 2013, IHD had become the foremost cause of mortality worldwide, with global deaths escalating from 5.74 million in 1990 (accounting for 12% of the global population) to 8.14 million in 2013 (16.8%) [4].

Atrial fibrillation is estimated to affect around 2% of the population, with its prevalence increasing notably with age—affecting 0.14% of individuals under 50 years, 4% of those aged 60–70, and up to 14% among those over 80 [2,5]. Both IHD and AF share overlapping risk factors such as hypertension, diabetes, obesity, sleep apnea, and tobacco use. Moreover, systemic inflammation is recognized as a key contributor to the pathogenesis of both conditions [6].

Among patients with AF, the proportion who also have IHD ranges between 17% and 46.5% [7]. Findings from major clinical trials, including ROCKET-AF [8] and RE-LY [9], have documented the presence of IHD in 17% of AF cases. According to a study by I.C. Van Gelder and colleagues, 18% of patients with persistent AF were also diagnosed with IHD [10]. Similarly, research by S. Kralev et al. identified significant coronary artery stenosis in 13% of AF patients undergoing coronary angiography, with the prevalence of sustained arrhythmia being nearly equivalent in patients with and without IHD—30% and 27%, respectively [11].

Conversely, atrial fibrillation appears to be less common among those diagnosed with IHD, with estimates suggesting a prevalence of only 0.2% to 5% in this group [12].

Atrial Fibrillation and Myocardial Infarction

Atrial fibrillation (AF) frequently emerges as a complication following acute myocardial infarction (AMI), with its incidence reported in 6–21% of affected individuals [13]. Notably, approximately 10% of patients with a prior AMI already exhibit AF, while 25% of those who experience an AMI go on to develop atrial fibrillation.A comprehensive study of 2,460 patients with documented myocardial infarction demonstrated that structural damage to the atrial myocardium serves as an independent predictor of AF onset. This association persists irrespective of other clinical variables such as age, gender, left ventricular ejection fraction, left atrial volume, the timing of reperfusion therapy, or post-intervention coronary perfusion assessed using the TIMI flow grading system [14].

Atrial Fibrillation as a Predictor of Short- and Long-Term Adverse Outcomes in Acute Myocardial Infarction

Atrial fibrillation (AF) is recognized as a significant predictor of both short- and long-term adverse outcomes in patients with acute myocardial infarction (AMI). Its presence is strongly associated with increased overall mortality. Patients with a history of AMI and AF have higher death rates compared to those without arrhythmia. Notably, around half of newly diagnosed high atrial arrhythmias develop within the first month following an AMI. The prognostic impact of AF varies; for instance, patients who develop AF within 30 days of AMI face twice the risk of death compared to those without arrhythmia.A large-scale study involving over 6,000 patients with AMI confirmed that new-onset AF is a common and life-threatening complication. This arrhythmia not only increases the risk of mortality

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but also raises the likelihood of hospital readmission within 30 days. Additionally, patients with both AMI and AF are twice as likely to experience acute cerebrovascular events during hospitalization. These findings are consistent with data from the GRACE registry, which demonstrated that in-hospital mortality is three times higher among patients who develop new-onset AF during acute coronary syndrome. Moreover, these patients have nearly double the incidence of heart failure and are three times more likely to suffer from cardiogenic shock.

Mortality Risk Across Different AF Subtypes in AMI Patients and Potential Mechanisms of Thrombotic Events

In a large single-center study involving 2,980 patients with acute myocardial infarction (AMI), mortality outcomes were compared across different subtypes of atrial fibrillation (AF). The results showed that only patients with permanent or new-onset AF had significantly higher short- and long-term mortality rates compared to those without arrhythmia. In contrast, patients with documented paroxysmal AF had the lowest 30-day mortality rate among all AF subgroups—7.3%**,** which was close to the 5.2% observed in patients without AF. However, over a 10-year follow-up period, overall mortality remained elevated, though differences among subgroups were not statistically significant. In certain cases, thromboembolic AMI has been reported in patients with AF [18]. This arrhythmia has been linked to systemic inflammation**,** which may contribute to a prothrombotic state**,** ultimately precipitating myocardial infarction. Such inflammation could stem directly from AF or from the underlying atherosclerotic risk factors commonly associated with the arrhythmia.Other mechanisms may also explain the association between AF and AMI. For instance, episodes of rapid ventricular response in AF can provoke Type II MI**,** which is characterized by an imbalance between myocardial oxygen supply and demand, and typically does not involve ST-segment elevation.Evidence from major randomized trials supports these associations. In the ROCKET-AF study, AMI occurred in 101 patients (0.9% annually) receiving rivaroxaban and in 126 patients (1.1% annually) treated with warfarin [8]. Meanwhile, the RE-LY trial reported lower MI incidence rates: 0.53% per year in patients taking warfarin and 0.72% per year in those receiving dabigatran 110 mg twice daily [8].

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