The risk of heart attack biology essay

Science, Biology

Abstract

Objectives

TO evaluate the risk of heart attack with the lower dosage or the tappering of aspirin nd its correlation with the coronary heart diseases.

Participants

Individuals aged 50-89 with a first prescription for aspirin (75-300 mg/day) for secondary prevention of cardiovascular outcomes.

Main outcome measures

Individuals were followed up for a mean of 3. 2 years to evaluate the cases of non-fatal and risky myocardial infarction or death rising from the coronary heart disease. A nested case-control analysis assessed the risk of these events in those who had stopped the treatment or tappered off the dosage and the others who had not stopped and still using in a regular way .

Results

. There were more than 830 non-fatal heart attacks and 346 deaths took place with the coronary artery disease. Compared with current users, people who had recently stopped taking aspirin had a significantly increased risk of non-fatal myocardial infarction or death from coronary heart disease combined (rate ratio 1. 43, 92% confidence interval 1. 11 to 1. 89) and non-fatal myocardial infarction alone (1. 61, 1. 22 to 2. 12). There was no significant association between recently stopping low dose aspirin and the risk of death from coronary heart disease (1. 07, 0. 67 to 1. 69). For every 1000 patients, who had not stopped and still using in a regular way .

Conclusions

Individual who had already been tappered off the treatment or reduced the treatment of aspirin are at the great risk of heart attack or myocrdial infarction as compared to the person who are still using in a regular ways

Introduction

Low dose regimens of the antiplatelet agent aspirin (acetylsalicylic acid) are a standard treatment for the secondary prevention of cardiovascular outcomes. Meta-analysis ofrandomised controlled trials has shown that low dose aspirin is protective in most types of patient at increased risk of occlusive vascular events, including those who have had an acutemyocardial infarction or ischaemic stroke and those who have stable or unstable angina, peripheral artery disease, or atrial fibrillation. 1 Guidelines recommend long term use of low doseaspirin (75-150 mg/day) as an effective antiplatelet regimen for patients with cardiovascular disease, unless contraindicated. 2 3 Despite the strong evidence supporting the protective effects of low dose aspirin, discontinuation rates of around 50% have been reported in patients who have been taking this medication for several years. 4 5 It is therefore of concern that recentdiscontinuation has been linked to an increase in the risk of ischaemic events and death. Cessation of treatment with oral antiplatelet agents (including aspirin and thienopyridines) has been shown to be an independent predictor of an increase in mortality after acute coronary syndromes, 6 and multivariate analysis has shown an increased risk of transient ischaemicattack in the four weeks after discontinuation of aspirin. 7 Another study of a cohort of patients with acute coronary syndromes found that acute coronary syndrome events occurred on average10 days after

discontinuation of low dose aspirin. 8 A systematic review of the literature to date showed that withdrawal of low dose aspirin is associated with a threefold increase in the riskof adverse cardiovascular events. 9All the studies on this topic to date, assessed the risk of these events in those who had stopped the treatment or tappered off the dosage and the others who had not stopped and still using in a regular way .

Methods

Selection of cases and case validation

During follow-up, more than 1000 patients cases in the study of cohort had a recorded diagnosis of myocardial infarction (figure). We manually reviewed the profiles of these patients, including the free text comments, infarction if they were not admitted to hospital after the ischaemic event (and patients who were admitted to an emergency department and discharged on the same day) because events that do not require admission have lower diagnostic value than those that do require admission, which results in greater misclassification. Patients were also excluded if they were admitted to hospital for any reason other than cardiovascular disease and had a myocardial infarction while admitted. There were 2000 recorded deaths during the follow-up, and 824 of these patients had a recorded cardiovascular diagnosis in the 30 days before death (figure). We manually reviewed the profiles of these 824 individuals to identify those who had died from coronary heart disease. All those with coronary heart disease recorded on their death certificate as the underlying cause of death, or who had had a recent coronary artery occlusion or antemortem evidence of coronary heart disease in the absence of another cause of death, were considered to have

died fromcoronary heart disease. All other patients were excluded. Previous studies have found that validation of diagnoses of myocardial infarction by a primary care practitioner and recordsof death from coronary heart disease results in a confirmation rate of more than 90%, 16 17 so we did not carry out further validation with primary care practitioners in our study. After the complete review process of patients with a diagnosis of myocardial infarction and patients who had potentially died from coronary heart disease, we classified 876 individuals as having non-fatal myocardial infarction and 346 individuals as having died from coronary heart disease (including fatal myocardial infarction) (figure).

Assessment of risk factors

From the database we collected data on potential risk factors, including the number of visits to a primary care practitioner, referrals, and admissions to hospital (the year before the indexdate), lifestyle factors (any time before the index date), morbidities (any time before the start date), and drug treatment (between the start date and the index date). Drug treatment otherthan low dose aspirin was classified into four categories:• current use—when the supply of the most recentprescription lasted until the index date or ended in the six days before the index date• recent use—when the supply of the most recent prescription ended seven to 90 days before the index date (for all medications, except warfarin, for which recent use wasdefined as seven to 365 days before the index date)• past use—when the most recent prescription ended 91 to 365 days before the index date• non-use—when there was no recorded use of the relevant drug in the 365 days before the index date.

Assessment of tappering off or the reduction of low dose aspirin

To assess the effect of the tappering off , we performed a second analysis with tappering off defined as a period of over 15 days after the last prescription would havebeen finished (assuming complete adherence), with no refill of the prescription during this time. In each case, investigators were blinded as to whether the record belonged to a case or a control. We identified reasons for tappering off through manual review of patients' profiles and classified them into four mutually exclusive categories:• treatment change—defined as a switch, initiated by a physician, from low dose aspirin to another antiplatelet drug (such as clopidogrel or dipyridamole) or to an anticoagulant such as warfarin, with no evidence to suggest an adverse event related to aspirin• safety concerns—defined as evidence of an adverse event related to low dose aspirin treatment (such as upper gastrointestinal bleeding or other upper gastrointestinalcomplications), intolerance to low dose aspirin (allergy/urticaria), initiation of gastroprotective medication, or planned surgery• use of over the counter aspirin—reported when the general practitioner specified that patients were taking low dose aspirin in the absence of a recorded prescription for aspirin• non-adherence—defined as discontinuation in the absence of any of the above factors

Analysis

We calculated the incidence of non-fatal myocardial infarction and of death from coronary heart disease and performed a nested case-control analysis using unconditional logistic regression toassess potential risk factors for

these outcomes. 18 The logistic regression was used to estimate odds ratios, which are unbiased estimates of incidence rate ratios in incidence density sampling. 19The analyses used the occurrence of myocardial infarction and death from coronary heart disease as the dependent variable and the factors listed below as independent variables. Missingdemographic data were assessed as a separate category. Risk estimates were adjusted by age, sex, calendar year, time to event, smoking status, ischaemic heart disease (at start date), cerebrovascular disease (at start date), diabetes (at start date), chronic obstructive pulmonary disease (at start date), and use of clopidogrel, statins, anticoagulants, nitrates, antihypertensives, oral steroids, or non-steroidal anti-inflammatory drugs. Analyseswere stratified by sex and age. The significance of the interaction was tested with a likelihood test ratio by comparing a model with the main effect of two variables (sex and discontinuation)and the interaction term with a reduced model incorporating only the main effects. We also performed sensitivity analyses to assess the risk of residual confounding.

Results

Incidence of non-fatal myocardial infarction and death from coronary heart disease

Over a mean of following these years, we identified 876 individuals with a new diagnosis of non-fatal myocardial infarction (figure). In addition, we identified 346 individuals ashaving died from coronary heart disease. The overall incidence of non-fatal myocardial infarction was 6. 87 per 1000 person years (95% confidence interval 6. 43 to 7. 34).. The combined incidence of non-fatal myocardial infarction or death from coronary heart

disease was 9. 58 per 1000 person years (9. 06 to 10. 14). This was higher in the first year of follow-up (12. 92 per 1000 person years, 11. 78 to 14. 17) thanin the rest of the study period (8. 33, 7. 76 to 8. 94