Abstract. In this study platelet aggregation was determined in 79 patients with primary open angle glaucoma (POAG) and 81 patients suspected of having glaucoma (ocular hypertension). There is a positive association between high age and the presence of vascular diseases (p < 0.01). An age dependent association between spontaneous platelet aggregation (SPA) and the presence of POAG was also observed (p < 0.05). This indicates that the incidence of SPA in the elder group of patients with POAG is higher than in the elder glaucoma suspect group and in the group of younger patients. The association between vascular diseases and SPA and between vascular diseases and the presence of POAG were not significant at the 5% level. The incidence of SPA is not influenced by sex distribution, by the presence of diabetes, smoking or the use of timolol maleate topically.

Introduction

Spontaneous platelet aggregation (SPA) is an in vitro phenomenon suggestive of a change from normal platelet behavior to hypersensitive platelets which form aggregates easily. A high incidence of SPA is reported in vascular diseases including primary thrombocythaemia, transient ischaemic attacks (TIA) and cerebro vascular accidents (CVA) (1-4), acute myocardial infarction (2) and furthermore in diabetes mellitus (5-7) and patients with diabetic retinopathy (6, 8, 9). Although the significance of the high incidence of SPA in those diseases is not yet clear, a causal relation was reported in thrombocythaemia (1), since acetyl salicylic acid (ASA) but not dipyramidole or coumarin released the symptoms and concurrently abolished SPA. Also ASA protected against recurrent TIA’s and ultimately cerebral infarction in normotensive men, but not in women (10).

Only a few studies on platelet behavior in glaucoma patients have been reported. It was suggested that in low tension glaucoma (LTG) hypercoagulability should be considered as a pathogenic factor (11). This was based on the observation that LTG patients tend to have a high prevalence of abnormal prolonged euglobulinelysis time or increased platelet adhesiveness. However, Joist and co-workers (12) failed to show an increased platelet adhesiveness in LTG patients compared to a control group. They reported a tendency to hyperaggregation for serial concentrations of adenosine diphosphate (ADP), epinephrine and collagen in these patients.
Microvascular insufficiency at the optic disc leading to splinter haemorrhages is a well known phenomenon in glaucoma patients (13–20). Moreover, there is a higher prevalence of disc haemorrhages in patients with open angle glaucoma than in patients suspected of having glaucoma (17). Furthermore, the association of the occurrence of disc haemorrhages and the development of new retinal nerve fibre layer defects was shown (13, 19).

In this study the preliminary results of a long-term prospective study are presented, in which the association of SPA with retinal nerve fibre layer defects i.e. primary open angle glaucoma (POAG) was investigated using a group of patients with suspected glaucoma as control.

Patients and methods

One hundred and sixty patients with either POAG (79) or suspected of having glaucoma (81) were included in the study. Most of the patients were seen for the first time in our glaucoma out-patient clinic. The group was not influenced by referral criteria. The group consisted of 44 males with POAG, 39 male glaucoma suspects, 35 females with POAG and 42 female glaucoma suspects and was chosen at random.

In all patients, ophthalmological and medical histories were recorded. Special attention was given to three groups of possible risk factors, i.e. (a) vascular diseases including hypertension, cardiovascular insufficiency, cerebrovascular accidents (CVA), transient ischaemic attacks (TIA) and peripheral vascular insufficiency; (b) diabetes mellitus; and (c) smoking. Patients with retinal vein thrombosis were not admitted to the study as also were patients with recent vascular pathology.

All patients had routine ophthalmological examination including measurement of visual acuity and refraction, evaluation of the anterior segment and ophthalmoscopy. Gonioscopy was performed using Goldmann's three-mirror contact-glass and the optic disc and blood vessels were evaluated binocularly in mydriasis. The visual field examination consisted of a combination of kinetic and static perimetry. Patients were referred to as having POAG when an open angle and either a visual field defect or a pathologically excavated optic disc or both were present. A patient was regarded as a glaucoma suspect if in a diurnal IOP-curve without medication the average IOP was 22 mmHg or higher or if one IOP over 25 mmHg was recorded in the presence of a normal visual field, a normal optic disc and an open angle.

In patients using cyclo-oxygenase inhibitors, phosphodiesterase inhibitors, or activators of the adenylcyclase system, this therapy was interrupted for at least 2 weeks before platelet aggregation was determined. Patients in which this therapy could not be stopped, were not included in this study.

Platelet aggregation was determined according to Born (21) using a Payton dual channel aggregometer between 2 and 3.30 p.m. Nine volumes of venous blood were collected into plastic tubes containing one volume of 3.2%