

Retinal Vein Thrombosis despite Treatment for Hypertension

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There is a well-known association between retinal vein thrombosis (RVT) and hypertension[1-4]. Recently bilateral branch vein thrombosis[5], and bilateral central retinal vein thrombosis have been attributed to hypertension[6].

Many ophthalmologists believe that adequate control of hypertension may prevent the development of this blinding condition, but there is no direct evidence to support this belief[5]. It is known, however, that the lowering of blood pressure reverses retinal vessel spasm and the other fundal findings associated with raised blood pressure[7]. It is also known that treating hypertension lowers the incidence of cerebrovascular accidents and decreases the incidence of other cardiovascular disorders[8]. This evidence indirectly suggests that control of hypertension may prevent RVT formation.

The purpose of this study was twofold. First, we wanted to determine if antihypertensive therapy protects patients from developing RVT in the same way as it protects patients from the development of other cardiovascular disorders. Second, we wanted to determine the degree of blood pressure control in those patients who, despite therapy, may have gone on to develop a retinal vein thrombosis.

Materials and Methods

Forty-two patients with RVT were studied in the Eye Department at the Tennent Institute of Ophthalmology. All patients were initially questioned about a history of hypertension. A patient having such a history was then asked for details of his drug therapy, which were documented.

All patients were then subjected to a full ophthalmological history and examination, including slit-lamp and fundal examination. At the end of the examination, when the patient was familiar with his or her environment, the blood pressure was measured. If we found the blood pressure to be raised in a patient already on treatment for this condition, the patient was referred back to his general

practitioner for reassessment. All new cases of hypertension were referred to a hospital blood pressure clinic for confirmation of our findings and further management. None of the patients reported in this article was therefore diagnosed solely by us as having hypertension.

All patients subsequently took part in a study on blood viscosity and haemostatic factors in RVT[9]. At the end of this study, details of the patient's blood pressures were reviewed and analysed. If the case notes had incomplete data about the management of hypertension at the time of onset of the RVT, the patient's GP was contacted for these details.

Results

Of 42 patients presenting to the ophthalmologists with RVT 22 were found to have hypertension (52.4 per cent). Of these, 15 patients were already on antihypertensive therapy when their RVT occurred (66.6 per cent). This clearly indicates that RVT can occur in patients receiving drug treatment for hypertension.

Of the 15 patients being treated, 14 had blood pressure levels that could be considered to be inadequately treated (i.e. 93 per cent had diastolic levels of 90 mm Hg or more). Only one patient had a diastolic blood pressure below 90 mm Hg. Seven of the 22 patients were newly diagnosed as suffering from hypertension. The mean age of all the patients was 67 years.

Table 1 gives details of the sexes, BP levels, drug therapy, and type of RVT in the 22 hypertensive patients. Cases 1-15 were those patients who arrived at the ophthalmology clinic on drug therapy for their hypertension; cases 16-22 were those patients who were diagnosed as newly hypertensive at their first visit. Case 15 was the only patient on antihypertensive treatment who had a diastolic level below 90 mm Hg. Her systolic level, however, was 180 mm Hg. Cases 12 and 14 were the patients with diastolic levels of 90 mm Hg. The other 12 patients on drug therapy all had diastolic levels above 90 mm Hg (80 per cent).

Of the seven newly diagnosed cases of hypertension, six had diastolic levels above 90 mm Hg. Of the 21 patients

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Table 1. Sex, BP level, type of RVT at presentation and antihypertensive therapy (cases 1-15) at the time of the RVT in 22 patients. CRVT = central retinal vein thrombosis. BVT = branch vein thrombosis.

Case Number	Sex	BP Level (mm Hg)	Type of RVT	Drug Treatment
1	F	170/110	BVT	Bendrofluzide
2	M	130/98	CRVT	Bendrofluzide
3	M	166/94	CRVT	Atenolol and Bendrofluzide
4	F	210/100	BVT	Methyldopa
5	M	170/100	Bilateral BVT	Oxprenolol
6	M	180/98	CRVT	Methyldopa
7	M	240/110	BVT	Methyldopa and Bendrofluzide
8	M	170/110	CRVT	Atenolol and Bendrofluzide
9	F	162/98	CRVT	Methyldopa and Bendrofluzide
10	F	180/100	CRVT	Methyldopa and Bendrofluzide
11	F	220/110	CRVT	Hydralazine hydrochloride
12	M	150/90	CRVT	Bendrofluzide
13	M	160/94	BVT	Frusemide
14	M	150/90	BVT	Propranolol
15	F	180/80	BVT	Bumetanide
16	M	196/134	CRVT	Nil
17	M	240/108	CRVT	Nil
18	F	180/110	CRVT	Nil
19	M	200/110	Bilateral BVT	Nil
20	M	156/96	CRVT	Nil
21	F	176/90	BVT	Nil
22	F	180/100	CRVT	Nil

with diastolic blood pressures of 90 mm Hg or more, 13 had central retinal vein thrombosis (62 per cent), while eight had branch vein thrombosis (38 per cent).

Discussion

Central retinal vein thrombosis and branch vein thrombosis can cause profound unioocular visual loss[3]. Both conditions can on occasion become bilateral[4,5]. Many different methods of treatment have been tried in RVT to improve visual acuity once the thrombosis has occurred but none has proved effective[6]. Prophylaxis is therefore of great importance.

The association between RVT and hypertension is well-known[1-4,6], but the association between control of hypertension and the prevention of RVT has not been specifically investigated. This study clearly indicates that elderly patients on antihypertensive therapy with a diastolic blood pressure of 90 mm Hg or more remain at risk of developing RVT. Only one of 15 patients on antihypertensive therapy when the RVT occurred had a diastolic blood pressure below 90 mm Hg.

Modern drug therapy is known to lower the incidence

of many types of vascular diseases secondary to hypertension[8,10]. There is, however, much debate among physicians both about the level at which treatment for hypertension should be instituted, and to what level the blood pressure should be reduced in order to have beneficial systemic effects[10,11]. Many physicians tend to accept a diastolic pressure of below 100 mm Hg as satisfactory, particularly in elderly patients such as these. We believe, however, that this study tends to support the view that hypertension should be aggressively treated, i.e. brought down slowly to a level below 90 mm Hg, to prevent RVT. We feel that unless GPs and physicians realise that a blood pressure of 90 mm Hg or more leaves patients at risk of developing RVT, ophthalmologists will continue to see and have to manage this blinding disease.

This study has some limitations. It is a retrospective study, and as such does not enable us to prove statistically that good control of mild hypertension definitely prevents RVT. The best way of proving that good control of hypertension prevents the development of RVT would be to follow up a large group of hypertensives prospectively, comparing the incidence of RVT in those with well-controlled hypertension with those in patients who are either poorly controlled or receiving no treatment. Such a study is clearly outside the scope of ophthalmologists, but it is hoped that physicians studying the value of treatment in hypertension will consider the development of RVT as a major criterion for inclusion in their study. The question of control of hypertension and the development of RVT requires urgent clarification in view of both the sight-threatening effects of RVT and the lack of treatment for this disease.

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