IV LABETALOL IN THE MANAGEMENT OF SEVERE HYPERTENSION

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SYNOPSIS

Intravenous Labetalol was shown to be effective in lowering the blood pressures in 14 patients out of 20 patients with severe hypertension. The reduction in blood pressure was rapid and yet not precipitous and no cardiac or cerebrovascular complications were encountered. Therefore it would have appeared that intravenous Labetalol is a useful drug in the management of severe hypertension.

INTRODUCTION

Before the introduction of potent hypotensive drugs, malignant hypertension was a uniformly fatal disease. Nowadays, despite the availability of potent hypotensive drugs, it still carries a considerable morbidity and mortality. Rapid reduction of blood pressure is indicated in hypertensive emergencies and the current drug of choice is usually a vasodilator such as diazoxide. Diazoxide is very effective but it may produce a precipitous fall in blood pressure as well as a reflex tachycardia, and it is difficult to predict the rate and extent of reduction in blood pressure. Many of these patients have associated ischaemic heart disease and cerebrovascular disease so that too rapid a reduction in blood pressure has been reported to cause angina, myocardial infarction, strokes and death (1, 2, 3).

Labetalol is a new adrenoreceptor blocking agent with both alpha and beta blocking properties. It reduces blood pressure when administered both orally (4) and intravenously (5). Intravenous Labetalol has been shown in a few reports to be effective in rapidly lowering the blood pressure in severe hypertension (5, 6, 7).

In this paper, we present our experience with intravenous Labetalol in Singapore.

PATIENTS AND METHODS

Twenty patients, aged 38 to 64 years, seen in the University Department of Medicine, Singapore General Hospital over a one-year period, were treated with intravenous labetalol. Their pre-treatment blood pressures ranged from 220/134 to > 260/170 mm Hg. 17 patients had diastolic blood pressures of 140 mm Hg or greater and 3 patients with diastolic blood pressures of 130 to 140 mm Hg had either fundal haemorrhages or papilloedema. None had bronchial asthma or cardiac failure. The patients were admitted to the intensive care unit and remained supine for at least 24 hours after treatment.

Blood pressures were measured by a standard Accosson mercurial sphygmomanometer. After 3 initial blood pressure readings at 5-minute intervals, labetalol was given intravenously in bolus doses of 50 mg, each over one minute, and repeated every 5 minutes, until the diastolic blood pressure fell to 120 mm Hg or lower or a maximum of 200 mg had been given. Blood pressure and pulse rate were recorded every minute for the first 30 minutes and subsequently at 15-60 minute intervals.

Oral therapy with a variety of drugs was initiated 30 minutes after starting intravenous labetalol.

The response to labetalol was defined as satisfactory if the diastolic blood pressure fell to 120 mm Hg or lower at 30 minutes after initiation of therapy.

RESULTS

14 of the 20 patients had a satisfactory reduction in blood pressure. Of these, 10 patients required 100 mg while 4 patients required 200 mg. 6 patients did not have a satisfactory response despite the recommended maximum dose of 200 mg. Their blood pressures were subsequently controlled by oral therapy with methyldopa, chlorothiazide and propranolol. In two patients, intravenous diazoxide was used as well.

The reduction in blood pressure was gradual over 20 to 30 minutes in all 14 patients who showed a satisfactory response. None of the patients had a precipitous fall in blood pressure and no complications were encountered. One patient experienced slight dizziness when his blood pressure was lowered from 240/140 to 164/112 after 100 mg labetalol.

Fig. 1 shows the blood pressures before and after IV Labetalol in the 14 patients who had a satisfactory response. Systolic blood pressures fell from a mean of 238 mm Hg to 174 mm Hg ($p<0.0001$) and diastolic blood pressures fell from a mean of 149 mm Hg to 112 mm Hg ($p<0.0001$).

Fig. 2 shows the blood pressures of the 6 patients who did not respond satisfactorily to IV Labetalol. Systolic blood pressures fell from a mean of 238 mm Hg to 201 mm Hg ($p<0.01$) and diastolic blood pressure fell from a mean of 151 mm Hg to only 142 mm Hg (not statistically significant).

Fig. 3 shows the response of 100 mg Labetalol in one patient. The blood pressure fell from 210/140 to 200/120 after 50 mg, and then to 170/100 after the second 50 mg and remained stable thereafter.

Fig. 4 shows another patient who required 200 mg. His pre-treatment blood pressure was very high - 250/170. It was gradually lowered in 30 minutes to 170/120. Oral therapy subsequently controlled the blood pressure further.

DISCUSSION

We have shown in our study that 14 of the 20 patients (70%) with severe hypertension responded to intravenous Labetalol. The reduction in blood pressure was gradual compared with the more abrupt changes seen with intravenous diazoxide, and no cardiac or cerebrovascular complications were encountered. Intravenous Labetalol is therefore an effective yet safe drug to use in severe hypertension.

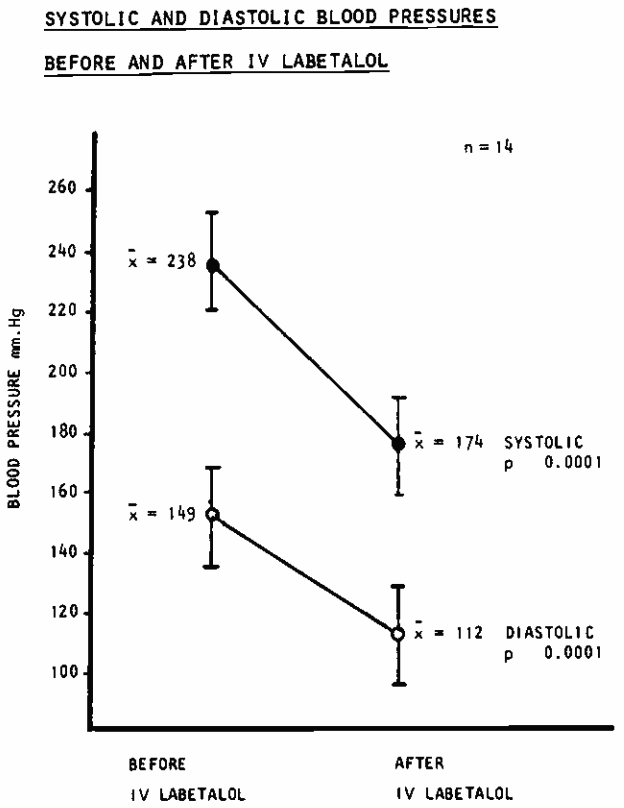

Fig. 1 Blood pressure response to IV Labetalol in the 14 patients who responded satisfactorily.

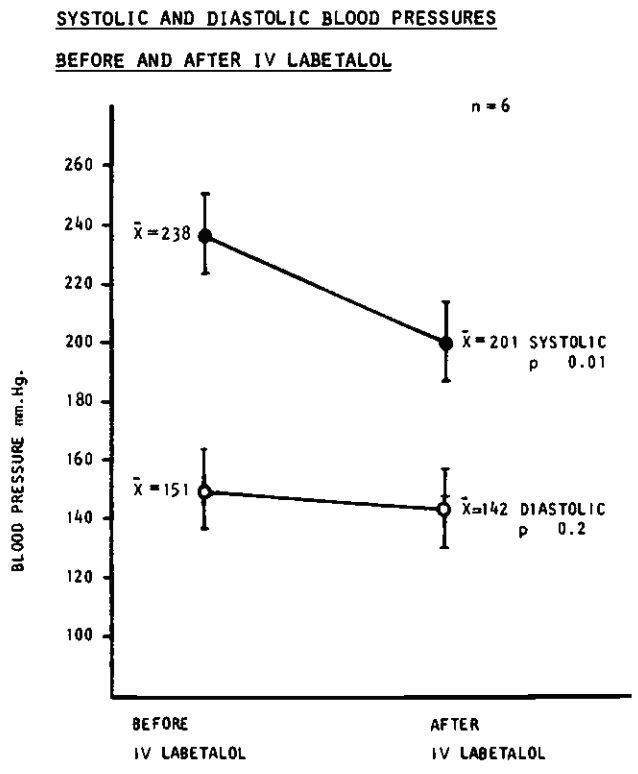

Fig. 2 Blood pressure response to IV Labetalol in the 6 patients who had a poor response.

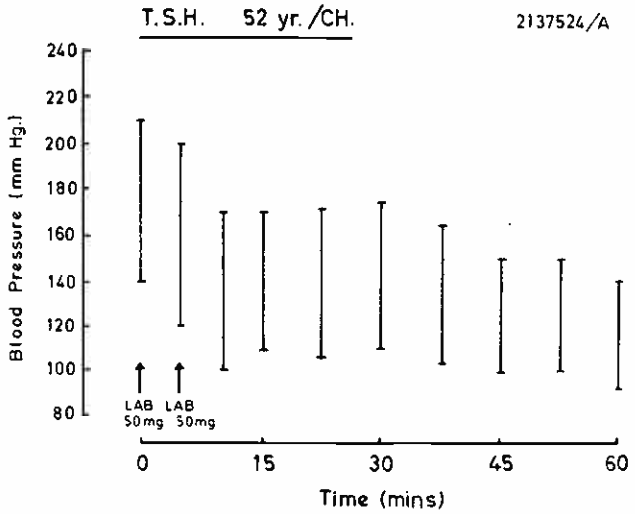

Fig. 3 Blood pressure response in a patient who required 100mg labetalol to control the blood pressure.

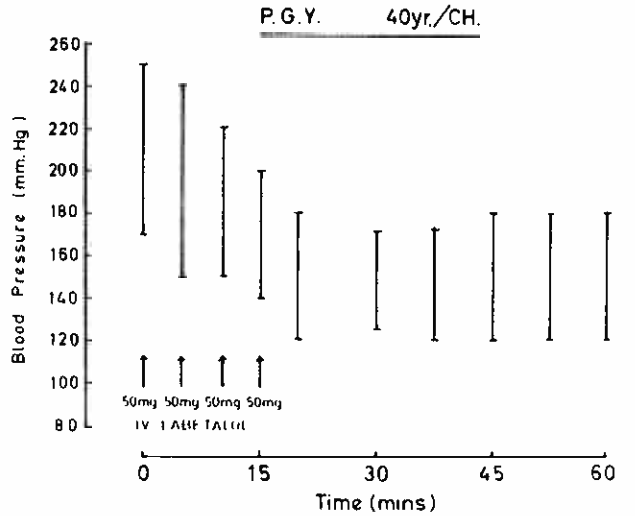

Fig. 4 Blood pressure response in a patient who required 200mg labetalol to lower the blood pressure.

Although 6 of our patients (30%) did not show a satisfactory reduction in blood pressure despite the recommended maximum dose of 200 mg Labetalol, their blood pressures were subsequently gradually controlled with oral therapy and intravenous diazoxide. IVLabetalol therefore appears to be less potent than IV diazoxide and may fail to lower the blood pressure in some patients. Intravenous diazoxide may then be given if the situation warranted its use. However, in view of its more predictable response, we recommend that intravenous Labetalol should be the first line of therapy in severe hypertension.

Labetalol acts mainly by its alpha-blockade properties causing vasodilatation. At the same time, it blocks the beta receptors in the heart to prevent the reflex tachycardia and increase in cardiac output. These response is therefore similar to that produced by concurrently infusing propranolol and hydrallazine.

IV Labetalol may be administered either as repeated bolus doses or as a continuous infusion. Both techniques have been shown to be equally effective (5, 6, 8). The infusion technique produces a more gradual and controlled fall in blood pressure but it is more time consuming.

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