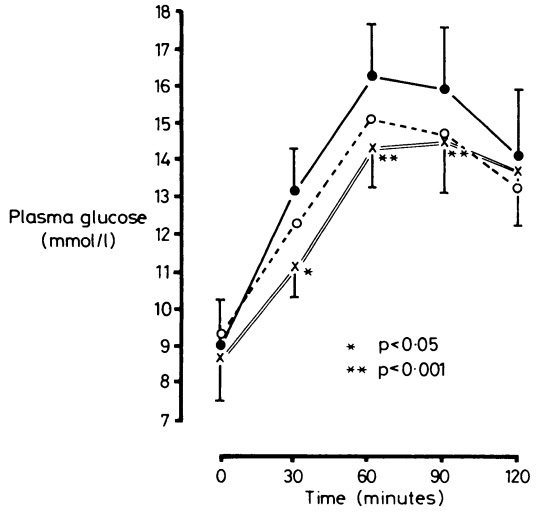

Mean plasma glucose concentration during standard oral 50 g glucose tolerance test (●——●), glucose tolerance test with karela juice (×═══×), and glucose tolerance test after consumption of 0·23 kg fried karela daily (○----○). Vertical bars represent standard error of mean and are not shown for the test using fried karela for the sake of clarity.
*$p<0·05$. **$p<0·01$.
Conversion: SI to traditional units—Glucose: 1 mmol/l ≈ 18 mg/100 ml.

Insulin concentrations with karela in the diabetics and rats were significantly different from the results in the standard test only twice. The initial concentration in the test with karela juice added was significantly higher than that in the standard test ($31·3 \pm 13·7$ *v* $24·6 \pm 10·6$ mU/l; $p < 0·05$); and the concentration at 60 minutes in the test after the patients had taken fried karela was significantly lower than that in the standard test ($42·3 \pm 22·8$ *v* $75·2 \pm 50·5$ mU/l; $p < 0·05$).

Glycosylated haemoglobin was $17·9 \pm 3·1\%$ after patients had taken fried karela, which was significantly different ($p < 0·01$) from the results obtained in the standard test ($19·6 \pm 2·2\%$) and in the test with added karela juice ($19·2 \pm 2·0\%$).

Discussion

We have confirmed the hypoglycaemic effect of karela juice in animals[3] and shown that it is not due to hyperinsulinaemia; previous studies have shown that it does not result from reduced intestinal absorption.[4] Our study has shown clearly for the first time that karela improves glucose tolerance in diabetes, confirming previous anecdotal reports.[1 5] The effect was most pronounced with raw juice, but a small improvement occurred with fried karela.

As serum insulin concentrations were not increased karela may directly influence hepatic or peripheral glucose disposal. The reduction in glycosylated haemoglobin in patients receiving hypoglycaemic agents suggests an extrapancreatic effect. Karela has been used extensively in fringe medicine without serious side effects and merits further study. Doctors supervising Asian diabetics should be aware of its hypoglycaemic properties.

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Labetalol-induced toxic myopathy

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Abstract

Labetalol has been successful in treating hypertension, and few side effects have been reported, although there have been cases of muscle pain during treatment. A patient with essential hypertension treated with labetalol 600 mg daily complained of muscle pains, particularly in the legs. No neurological abnormality was found, but the activity of muscle enzymes in the blood was high. Findings on electromyography were compatible with myositis and electron microscopical findings suggested toxic myopathy. Labetalol was stopped for 10 days, and the muscle pain disappeared and enzyme activity returned to normal. When labetalol was restarted the pain returned and enzyme activities rose.

Myopathy should be considered in patients experiencing muscle pain after treatment with labetalol.

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Introduction

Labetalol is a relatively new hypotensive agent, with competitive antagonist activity in both alpha- and beta-adrenergic receptors.[1] Its effectiveness in the treatment of hypertension has not been impeded by serious side effects. Rare instances of muscle pain during treatment have been mentioned in the published reports,[2-4] but there has been no report of labetalol-induced toxic myopathy. We describe a case in which labetalol treatment was complicated by toxic myopathy, which disappeared when the drug was withdrawn and withdrawal of the drug resulted in disappearance of the condition.

Case report

A 27-year-old man was found to have hypertension on routine examination. After an intensive investigation essential hypertension was confirmed and treatment begun with chlorthalidone 100 mg/day. Subsequently, clonidine 0·6 mg daily was added. Two years later, when the patient became resistant to these medicines and blood pressure rose to 106/110 mm Hg, labetalol 600 mg/day was prescribed instead.

While on this treatment the man began to complain of muscle pain, especially in the legs. Neurological examination did not show any abnormality: the muscle strength was normal, there was no wasting, and reflexes were normal. The activities of muscle enzymes in the blood—creatine phosphokinase, lactic dehydrogenase, and aldolase—were persistently high. Triiodothyronine and thyroxine concentrations were normal. On electrodiagnostic study the motor-nerve conduction velocity from ulnar, peroneal, and posterior tibial nerves on both sides was normal. The electromyogram from both gastrocnemius muscles showed increased insertion activity. On rest there was spontaneous activity with fibrillation potentials and positive sharp waves. On voluntary contraction the interference pattern was not full and there were many polyphasic potentials; motor unit potentials were in low amplitude and short duration. Myotonic reaction was not found. The electromyogram findings were compatible with myositis, and a biopsy specimen was taken from the deltoid muscle. Light microscopy did not show any histological changes, and the histochemical examination (adenosinetriphosphatase succinic dehydrogenase staining) showed a normal typing of muscle fibres. Electronmicroscopy study showed many vacuoles of various sizes in the sarcoplasm under the sarcolemma, without staining and without connection to any structure in the cell. (fig 1). These findings confirmed non-specific toxic myopathy. The

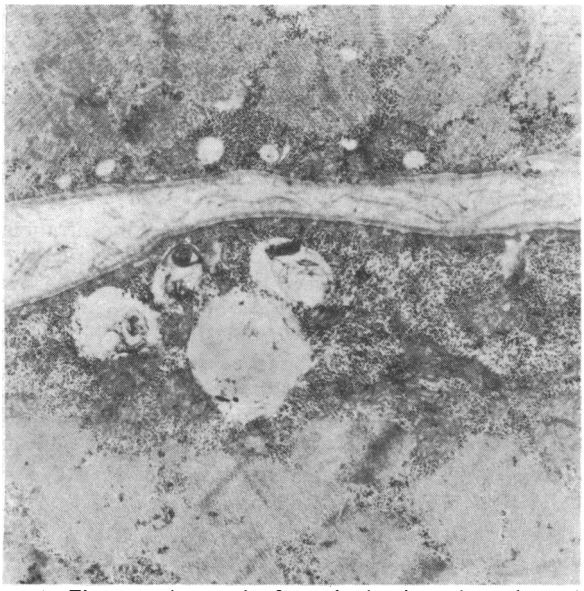

FIG 1—Electron micrograph of muscle showing subsarcolemmal vacuoles and abundant glycogen granules. ×16 000 (original magnification).

labetalol was stopped for 10 days, during which time the muscle pains disappeared and the enzyme activities returned to normal. A few days later, and after we had obtained the informed consent of the patient, we restarted the labetalol. The muscle pain reappeared soon and serum muscle enzyme activities rose (fig 2). Labetalol was stopped and atenolol 100 mg/twice daily was prescribed, with effective response and with no adverse reaction.

Discussion

Muscle pain and cramp in the calves have been mentioned in only a few studies on labetalol, and they disappeared within a short time without the necessity of stopping the drug. Several drugs may induce muscle disorder, including steroids, anti-

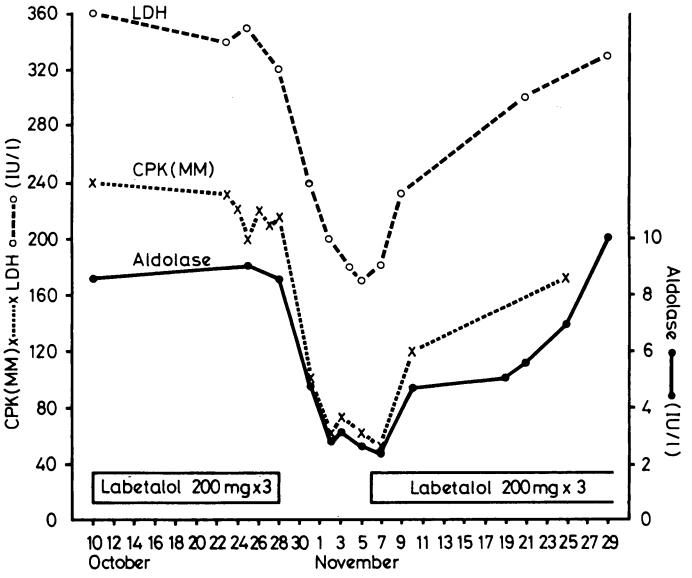

FIG 2—Activity of muscle enzymes (lactic dehydrogenase (LDH), creatine phosphokinase (CPK(MM)) and aldolase) during treatment with labetalol, after withdrawal, and on rechallenge.

malarial agents (plasmocid, chloroquine), vincristine, dimethyl sulphoxide, and clofibrate. The vacuolar changes found in our case are similar to those described with chloroquine treatment.[5]

According to Walton[6] the introduction of new therapeutic agents may produce further drug-induced myopathies, which are likely to be reversible when the agent is withdrawn. Clinicians should be aware that muscle weakness after labetalol treatment may be a prelude to myopathy.

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ONE HUNDRED YEARS AGO *The Contagious Diseases Acts.*—Mr Hopwood asked the Secretary of State for the Home Department, whether one or more surgeons employed in the compulsory examination of prostitutes under the Contagious Diseases Acts had been made justices of the peace, in order that they might carry out the Act in a twofold capacity, administering and executing the law; whether he will state by what Minister such gentlemen were recommended to Her Majesty for appointment; whether he approved of such a confusion of duties; and, whether the individuals in question should not be called upon to make their choice once for all to act either as magistrates or surgeons.—Sir W HARCOURT: As to this question, I have made inquiries, and I have not been able to discover that any such appointment has been made as that alluded to. (*British Medical Journal*, 1881.)