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Action of Zinc on Effect of Adrenalin Given Subcutaneously.

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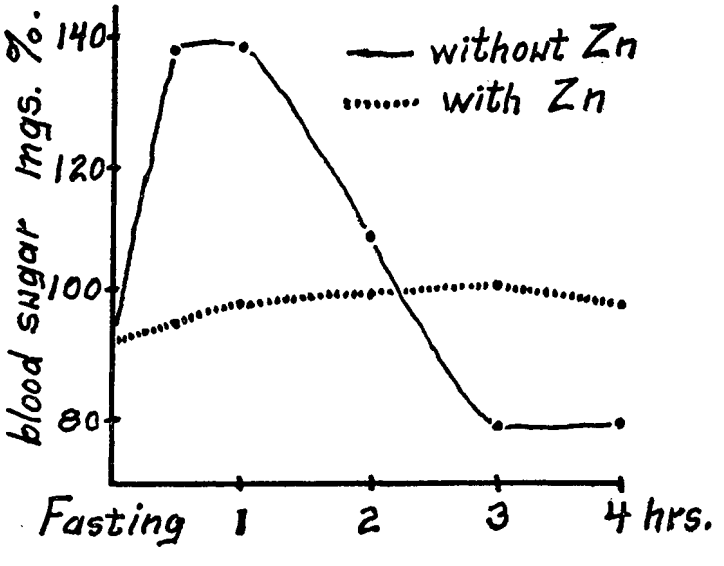
The interest in the effect of zinc on the action of insulin and various other hormones stimulated a study of its effect on the activity of adrenalin. The subjects were patients at rest in bed and in the post-absorptive state. Capillary blood sugar and blood pressure were determined before and for four hours after subcutaneous injection of 0.5 mg. of adrenalin hydrochloride (1-1000 solution). Curves for comparison were made with and without the added zinc, using symmetrical areas for injection and intervals of 2 to 3 days between examinations.

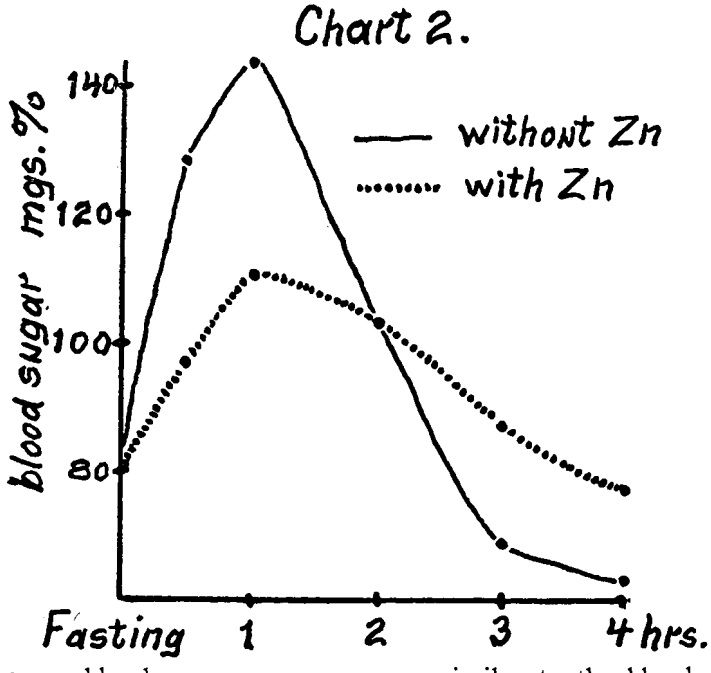
In the first series equal amounts of zinc and adrenalin were used. The zinc was added, immediately before injection, as 0.1 molar solution of zinc sulphate. Correction was made for the small increase in volume. The average blood sugar curves for 9 subjects are shown in Chart 1. The marked decrease in response is evident.

In the second series the effect of one-tenth as much zinc as adrenalin was studied. (0.05 mg. of zinc was given with 0.5 mg.

Chart 1.



of adrenalin. This is about the same order of magnitude as the concentration of zinc in commercial protamine zinc insulin.) The zinc was added as 0.01 molar zinc sulphate solution. The average blood sugar curves for 6 subjects are shown in Chart 2. The decrease in response to adrenalin is again evident.



Average blood pressure curves were similar to the blood sugar curves but, in individual cases, more irregular and not always consistent.

With small amounts of zinc the total activity of adrenalin appears to be definitely diminished. Since adrenalin is oxidized rapidly in the body, it seems probable that, under these conditions, it has been absorbed more slowly and therefore a greater proportion oxidized in a given interval of time.