

ABSTRACTS OF COMMUNICATIONS.

*Western New York Branch.***Thirteenth Meeting.***Rochester, New York, October 11, 1924.***30 (2553)****The influence of insulin on the respiratory metabolism of normal rabbits.**

By ESTELLE E. HAWLEY (Introduced by John R. Murlin).

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The data to date on the respiratory changes resulting from insulin injections are conflicting. It is generally agreed that insulin causes a rise in R. Q. when administered to normal subjects but just how this change is brought about is still a matter of discussion. Is the increase in quotient due to increase in CO₂, decrease in O₂, or both?

Normal healthy rabbits were used as the experimental animals in this series of experiments. All were carried out under the same conditions as to care, diet, and time elapsing between food and experiments. Great effort was made to obtain comparable results. The blood sugar curve coincident with the respiratory change was followed. This also served as a check on the potency of the insulin.

From the findings to date the following summary seems justified:

1. Insulin, when administered to normal animals brings about, first a slight decrease, then a decided increase in the R. Q. curve, reaching the peak two hours after injection and returning to the basal level four hours after.

2. A blood sugar drop accompanies the R. Q. change, the lowest blood sugar occurring at the peak of the curve. The return to normal is less rapid than the return to normal of the R. Q. though the curve is well on its return by the end of the four hours.

3. There is, in the second hour, both a decrease in the O_2 and an increase in the CO_2 , both changes tending to increase the R. Q.

4. The O_2 consumption and the heat production would indicate that the total metabolism is not markedly increased.

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The influence of insulin in phloridzin diabetes.

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In the hope of finding a more favorable subject than the depancreatized animal for study of the influence of insulin administered orally, twelve dogs were used after the establishment of the typical D:N ratio of Lusk. Insulin produced in the laboratory by the amyl alcohol method,¹ administered subcutaneously, caused not only a sharp decline in the excretion of sugar (and nitrogen), but also a rise in respiratory quotient from diabetic level (0.69) to as high as 0.85. Sugar was administered by stomach both in control and in insulin periods. In several instances after a dose of 1 R. U. per two kilos dog the R. Q. rose within the first two hours only to 0.77 or 0.78 and immediately dropped back to diabetic level. The effect on the excretion of nitrogen was sometimes parallel with and in a few instances greater than the effect on the excretion of sugar.

Insulin was given orally in several different combinations: in cod-liver oil emulsion (no effect); in oleic acid suspension (no effect); in blood serum (some effect). The best results (rise in R. Q. to 0.77 or 0.79) were obtained after the use of 1 R. U. per kilo in the form of an enteric coated tablet containing insulin and malic acid.² The effect on the excretion of sugar was not so marked even with this tablet as after subcutaneous administration.

¹ Allen, Piper, Kimball and Murlin, PROC. SOC. EXP. BIOL. AND MED., 1923, xx, 519.

² Murlin, Sutter, Allen and Piper, PROC. SOC. EXP. BIOL. AND MED., 1924, xxi, 338.