

sulfide from elemental sulfur. It is concluded that formation of sulfide by the sulfur bacteria is evidence that these organisms also contain substances possessing active -SH groups.

The fact that the sulfur bacteria hydrogenate sulfur during growth raises the question as to whether or not this is a necessary reaction preceding utilization of elemental sulfur as a source of energy. Should this prove to be the case it would necessitate a revision of conceptions concerning the mechanism of transformation of sulfur by these bacteria. It is equally possible that the sulfide may have no more significance in the nutrition of the sulfur bacteria than in that of the great number of heterotrophic microorganisms which have the same reducing capacity. By reason of the fact that the nature of sulfur precipitated by the sulfur bacteria belonging to the order Thiobacteriales is the same as that formed by *Th. thioparus*, and that the former may be presumed to contain compounds having -SH groups, there is reason to suspect that they are able to hydrogenate their sulfur globules and other added sulfur.

8881 P

Pressor Effects of Kidney Extracts from Patients and Dogs with Hypertension.

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A number of observers have found that extracts from the kidneys of various animals may have pressor effects.¹⁻⁷ The object of the present investigation was to determine whether extracts of kidneys from human beings and dogs with hypertension had greater pressor effects than those of control kidneys.

Kidneys were obtained at autopsy from 15 patients with hypertension and from 17 control subjects. The hypertensive group consisted of 9 patients with benign hypertension, 2 with malignant hypertension, 2 with chronic glomerular nephritis, and 2 with pyelonephritis and secondary contracted kidneys. The material was put

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¹ Tigerstedt, R., and Bergman, G., *Skand. Arch. f. Physiol.*, 1898, **8**, 223.

² Bingel, A., and Strauss, E., *Deutsch Arch. f. klin. Med.*, 1909, **96**, 476.

³ Livon, C., *Compt. med. Soc. de biol.*, 1898, **50**, 98.

⁴ Vincent, S., and Sheen, W., *J. Physiol.*, 1903, **29**, 242.

⁵ Pearce, R. M., *J. Exp. Med.*, 1909, **11**, 430.

⁶ Shaw, H. B., *Lancet*, 1906, **1**, 1295, 1375, 1455.

⁷ Forlanini and Riva-Rocci, quoted from Pearce.⁵

through a meat grinder, crushed in a mortar, shaken for 30 minutes with saline (one cc. per gm.), filtered and kept on ice. The tests were most satisfactorily performed on an unanesthetized dog with a Van Leersum (carotid) loop.⁸ In several instances records were obtained by direct cannulation of the carotid artery of anesthetized dogs and cats. Injections were made intravenously, using the equivalent of 7 gm. of tissue for the unanesthetized dog and smaller doses for the anesthetized animals.

A single injection usually resulted in a transient depressor effect followed by a gradual and prolonged rise which lasted from 10 minutes to over 3 hours. The average rise in blood pressure in the hypertensive group was 28 mm. of mercury, the range being 9 to 60 mm. of mercury. The average pressor effect in the non-hypertensive series was 12 mm. of mercury, the range being 0 to 48 mm. of mercury.

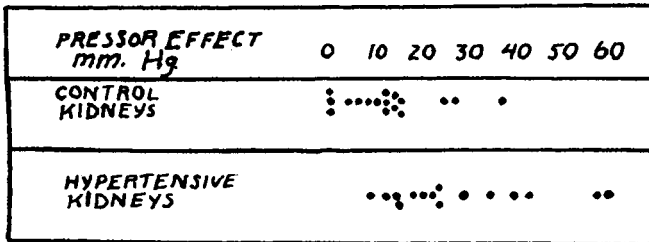


FIG. 1.

Pressor effects of saline extracts from kidneys of 15 patients with and 17 subjects without hypertension.

The pressor action in general was more prolonged in the hypertensive than in the non-hypertensive group. No striking differences in the preliminary depressor effects were observed. In general the pressor effect seemed less marked in the younger age groups.

In 2 instances no rise in blood pressure was obtained. It is of interest to note that the blood pressures of the subjects were low in both cases (90/60-80/60). The pressor substance was more concentrated in the cortex than in the medulla and was completely destroyed by boiling for 5 minutes (one experiment). These properties suggest that it is identical with the substance found in normal kidneys by other workers.^{1, 2}

In this small series no correlation was noted between the pressor effect on the one hand and the type and degree of hypertension, or the efficiency of renal function on the other.

It may be seen that considerable variation exists. This may be due, in part at least, to complicating factors, such as post mortem

⁸ Van Leersum, E. C., *Arch. Ges. Physiol.*, 1911, **142**, 377.

changes, manner of death, congestion and degeneration of the kidneys, age of patient, etc.

The above factors may be minimized by studying renal extracts of dogs with hypertension produced experimentally by means of unilateral renal ischemia.⁹ Fourteen such experiments were performed. After hypertension had been established, the ischemic kidney and the opposite unoperated kidney were removed, extracted and their pressor effects compared. In 11 out of 14 instances, the extract of the ischemic kidney had a significantly greater pressor effect than that of the normal kidney of the same animal, the average difference in maximum pressor effect being 23 mm. of mercury and the range 10 to 41 mm. of mercury. In 2 cases the differences were less than 10 mm. of mercury, and in one no difference was observed. In general the extracts made from ischemic kidneys appeared to have less pronounced preliminary depressor and more prolonged pressor effects than those prepared from normal kidneys. Harrison, Blalock and Mason¹⁰ have obtained similar results in dogs in which hypertension was produced by means of unilateral and bilateral renal ischemia, and by unilateral and bilateral ureteral obstruction.

The data are not sufficient to establish an etiologic relationship between the pressor substance in the kidneys and the elevation in blood pressure. The observations are compatible with the hypothesis that hypertension, both in the experimental animal and in man (whether "essential" or "secondary") may be due to an excess amount of a pressor substance present normally in the kidney.

8882 C

Positive Formol-Gel Reaction Associated with Hyperglobulinemia in Lymphogranuloma Inguinale, Multiple Myeloma and Hepatic Cirrhosis.

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It has been shown recently^{1, 2} that many cases of lymphogranuloma inguinale develop hyperproteinemia, comparable in degree, in-

⁹ Goldblatt, H., Lynch, J., Hanzel, R. F., and Summerville, W. W., *J. Exp. Med.*, 1934, **59**, 346.

¹⁰ Harrison, T. R., Blalock, A., and Mason, M. F. Personal communication.

¹ Williams, R. D., and Gutman, A. B., *PROC. SOC. EXP. BIOL. AND MED.*, 1936, **34**, 91.

² Gutman, A. B., Gutman, E. B., Jillson, R., and Williams, R. D., *J. Clin. Invest.*, 1936, **15**, 475.