

has made the following statement: "The conception of the interactions between the gonads and hypophysis is supported by a wealth of determined facts and both the conception and the facts argue against the possibility of stimulating either gonad by administration of gonad hormones. A great many biologic and clinical procedures have been carried out on the supposition that such a stimulation would follow, but no endocrine gland has yet been proven to be stimulated by the administration of substances which it itself produces."

In our experiments, the testicular hormone maintained the testes in an apparently normal condition after the hypophysis was removed. It was impossible, either grossly or microscopically, to differentiate between the testes of the hypophysectomized animals that received injections of the hormone and those of the normal littermate controls.

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Intravenous Administration of Wheat Germ to Patients with Pellagra.

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During the past 200 years various diets, drugs, and minerals have been recommended as therapeutic cures for pellagra. Yeast and wheat germ are two of the materials sometimes used in the treatment of this disease. Both of them contain fat, protein, and carbohydrate and are especially rich in the vitamin B complex. Goldberger and associates^{1, 2, 3} have found that both yeast and wheat germ are efficacious in the prevention of pellagra and possess curative properties when administered orally to the pellagrins. While studying various methods of treatment we observed⁴ that the mortality rate was very high in those individuals who because of oral

¹ Goldberger, J., and Tanner, W., *U. S. Public Health Report*, 1925, **40**, 54.

² Goldberger, J., Wheeler, G., Lillie, R., and Rogers, L., *U. S. Public Health Report*, 1926, **41**, 297.

³ Goldberger, J., and Wheeler, G., *U. S. Public Health Report*, 1927, Reprint No. 1181, 2383.

⁴ Spies, T., *Am. J. Med. Sci.*, 1932, **184**, 837.

lesions or vomiting did not tolerate a good diet. In an unpublished study, we found that 53% of all cases with pellagra died despite the fact that they received the best of hospital treatment including a high vitamin, high caloric diet if they were able to eat it. Since many of our patients with pellagra are unable either to ingest highly nutritious food or retain it after ingestion, it seemed worth while to attempt parenteral therapy. A solution rich in vitamin B and poor in lipoids and proteins was made from wheat germ.* It was injected intravenously into several laboratory animals as a 10% solution in normal saline and when it seemed to do them no harm it was administered to the writer and 20 patients on the general medical wards without any serious ill effects. It then seemed safe to inject it likewise in patients with pellagra. Six pellagra patients showed definite improvement while receiving a restricted diet and repeated injections of the wheat germ solution. Intravenous injections of the solution were then given to 4 pellagrins with severe vomiting who at the same time were denied food. Following the injections the stomatitis improved within the next 2 or 3 days. By the end of this period the patients desired food and it did not seem justifiable to withhold it any longer. None of the individuals had further vomiting and each made an uneventful recovery.

The intravenous method is not recommended as one of choice except possibly when a patient with pellagra is unable to assimilate food by mouth. It has the contraindications of intravenous injections in general and is occasionally followed by mild chill and in one instance a transient phlebitis occurred. In reporting the use of an extract of wheat germ for intravenous administration to patients with pellagra, no claims are made concerning its efficacy as a therapeutic agent although it is true that these patients improved following its use. Many variables, such as rest in bed, the injection of large quantities of normal saline, the withholding of food from individuals who are vomiting, and the tendency toward spontaneous remissions of pellagra must all be considered before any final evaluation can be made.

* The crude product was furnished through the courtesy of Dr. E. A. Sharp, Parke Davis & Co.