SHORT COMMUNICATIONS

REDUCTION IN THE BIOLOGICAL POTENCY OF HUMAN CHORIONIC GONADOTROPHIN BY ANTISERA TO HUMAN MENOPAUSAL GONADOTROPHIN

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Quantitative biological and immunological assays for gonadotrophins are used routinely in this laboratory to provide an index of tumour activity in patients with choriocarcinoma. Such tumours produce chorionic gonadotrophin (HCG) and this hormone is excreted in the urine together with the small amount of gonadotrophin of pituitary origin (HMG) which is always present in normal adult urines. The assay methods for gonadotrophins which are at present available do not allow differentiation between HCG and the luteinizing component of HMG. At the beginning of treatment when the rate of HCG excretion is usually high, this lack of specificity is not important, but towards the end of treatment when gonadotrophin levels approach the normal it is difficult to detect with certainty the slight HCG excess which will indicate the presence of a small amount of viable tumour tissue. In order to have a precise indication of complete destruction of the tumour, it is necessary to have a specific assay method for HCG.

It is now accepted that the luteinizing hormone of pituitary origin and HCG have common antigenic groupings and this accounts for the immunological cross-reactions which have been observed between antisera to HMG and HCG (Wide & Gemzell, 1962). However, Butt, Crooke & Cunningham (1961) and Lunenfeld, Isersky & Shelesnyak (1962) have reported that antisera to HMG while neutralizing the biological activity of HMG did not neutralize the biological activity of HCG.

If the biological effect of the HMG in a urinary extract could be completely neutralized by HMG antiserum without affecting the biological potency of HCG, a specific assay method could be devised.

Antisera were prepared against HMG (Pergonal) in two rabbits, R 119 and R 120, using Freunds complete adjuvant. Both antisera inhibited the biological activity of HMG when assayed by the rat prostatic weight gain method of Loraine (1950). To determine the effect of these antisera on HCG (Pregnyl), assays were carried out by the rat prostatic weight gain, the rat uterine weight gain (Delfs, 1941) and the ovarian ascorbic acid depletion (Parlow, 1958) methods. Two sets of serial dilutions of HCG were prepared over the required range of concentration for each bioassay.
To one set of standards was added a fixed volume of antiserum and to the other set the same volume of normal rabbit serum. The solutions were incubated at 4° overnight and then frozen until they were required for injection. The volume of antiserum used in the uterine weight method was 0.1 ml. at each dose level of HCG. A larger volume (0.15 ml.) was used for the other two methods. Five rats were used at each dose level. At low HCG levels the activity was completely neutralized by HMG antisera (Fig. 1). At higher levels there was a considerable reduction in biological potency when measured by all three methods.

It is concluded that the HMG antisera neutralized the biological effect of HCG and that this was probably due to cross-reacting antibodies. A specific assay for HCG therefore appears to be unattainable by this technique. These results are in agreement with those outlined in a short communication by Yoshizum & Paulsen, 1963.

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REFERENCES