dosage streptomycin will probably be widely used in the less severe types of tuberculosis. Even slight giddiness occurring in less than 10% of patients might make one hesitate to use chemotherapy in relatively mild cases. It is therefore important that there should be further investigation of the vestibular effects of streptomycin.

Summary

The effects of streptomycin on the vestibular apparatus were investigated in 76 cases under treatment for pulmonary tuberculosis.

Patients receiving 2 g. of streptomycin a day complained of giddiness almost four times as often as those receiving 1 g., and the giddiness was first noted significantly earlier.

Nystagmus and abnormalities in the caloric tests were often associated with a complaint of giddiness. Clinical tests for co-ordination of movement, such as walking along a line with the eyes shut, were useful only when there was gross ataxia; minor degrees of ataxia were difficult to interpret in patients who had been confined to bed, and some cases with absent caloric responses had normal walking tests.

Giddiness and nausea tended to occur in the same patients and at about the same time.

An attempt was made to prevent vestibular damage by giving antihistamine drugs prophylactically to patients receiving streptomycin. The results suggest that some success was achieved, but the evidence is not conclusive.

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VARIABILITY OF THE SPERM COUNT

BY

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It is not uncommonly assumed that one sperm count is adequate in the investigation of male fertility, and claims have been made for the beneficial effects of various forms of treatment of defective spermatogenesis if a single sperm count following the therapeutic course is substantially higher than a single count performed before treatment.

Our clinical impression being contrary to these views, we decided to ask each husband attending the Fertility Clinic to provide us, at his convenience, with three specimens for examination.

Material

Three seminal specimens have been examined from each of 226 husbands of couples attending the Fertility Clinic. The specimens were collected direct into a dry, clean, though not sterile jar with a screw top and brought to the clinic for examination with as little delay as possible. The husband was instructed to produce the specimen, so far as was conveniently possible, after three days' continence. There was no selection of cases, and all husbands of whom we have records of at least three sperm counts up to the time of the conclusion of the inquiry are included in the series. The counts in the series were not performed by a single technician, nor did the same person necessarily count all three specimens from any one individual patient. The technicians who, apart from ourselves, have carried out many of the counts have done so under our supervision until we were satisfied that their counting was reliable.

Sperm counting was done as follows: (1) Semen was thoroughly mixed and then drawn to the 0.5 mark in a white-cell pipette; (2) diluting fluid was drawn to the 11 mark; (3) the pipette was shaken gently until the fluid in the bulb was well mixed, then the diluting fluid in the fine part of the tube was shaken out; (4) one drop of the mixed fluid was placed on a Neubauer counting chamber; (5) the sperms were counted under a 4-mm. objective and with $\times 10$ eyepiece; (6) the number of sperms in 2 mm.^{2} were counted and five ciphers added to give the count per ml. In cases of marked oligospermia a proportionately larger number of squares were counted and an attempt was made to count at least 100 sperms.

Objects of the Study

The objects of this investigation were to determine in how many instances the three sperm counts varied from one another sufficiently to be misleading if one had had only one or two, but not three, counts available for consideration, and how often the initial count varied materially from one or both of the other two.

For this purpose we have divided the sperm density into three categories. The first is the "fertile" group. It is generally believed, and sometimes stated in treatises on infertility, that if the count is more than 60 millions per ml. there is considerable likelihood, in the absence

Results in 226 Cases

(92 Cases) All Counts in the Same Group			(134 Cases) One or More Counts in a Different Group from the Remainder, the Initial Count Being:			(50 Cases) Initial Count Under 60 mil./ml., any Subsequent Count Over 60 mil./ml., the Initial Count Being:		(40 Cases) Initial Count Over 60 mil./ml., any Subsequent Count Below 60 mil./ml., the Lower Being:		(97 Cases) All 3 Counts Under 60 mil./ml., the Highest Being:	
0–20 mil.	20–60 mil.	Over 60 mil.	0–20 mil.	20–60 mil.	Over 60 mil.	0–20 mil.	20–60 mil.	0–20 mil.	20–60 mil.	0–20 mil.	20–60 mil.
26	27	39	27	67	40	6	44	6	34	26	71

of other infertility factors, of the man proving to be fertile. The second category is the "infertile" group. We have excluded from this investigation all cases of "aspermia" in which no sperms could be found, because in our experience we have very seldom found sperms present in subsequent counts when the initial examination of a centrifuged specimen showed no sperms. It is generally agreed that if the density is below 20 millions per ml. the likelihood of the patient achieving parenthood is remote. This "infertile" group therefore has a range of 0–20 millions per ml. Those with sperm counts between 20 and 60 millions per ml. form a third group of husbands who have a "sporting chance" of achieving parenthood. This we will refer to as the "subfertile" group.

Discussion

In 134 cases in our series (59%) all three counts did not fall into the same group. In 90 cases (40%) at least one count was over 60 millions per ml., but of these 90 cases only 44% gave an initial count over 60 millions per ml. In 50 cases the initial count was under 60 millions per ml. though a subsequent count was over this figure, six cases (12%) showing an initial count of under 20 millions per ml. In 40 cases the initial count was over 60 millions per ml. though a subsequent count was under this figure, six (15%) being under 20 millions per ml.

The question arises whether these variations are the result of a high margin of error due to our technique of counting sperms. It has already been pointed out that the counts have been performed by a number of different individuals, and most of them have been done by technicians. It may well be desirable that the count should be performed by a highly trained seminologist, but this is not likely to be practicable in a busy fertility clinic such as ours, which has dealt with over 1,000 cases in three and a half years. Furthermore, there is no reason to suppose that a sperm count should prove more difficult to perform than a red cell count, and one is in the habit of accepting the result of such a simple haematological investigation even if it is performed in a routine pathological laboratory.

Nevertheless, it should be realized that there is a considerable variability innate in any haemocytometer count, however good the technique employed. Where, as in our work, 150 to 200 cells are counted, a variation of 20% between successive counts might be expected occasionally from that cause alone. For a statistical discussion of this problem Fisher (1948) may be consulted. In addition, it is likely that further errors are caused by the viscous nature of semen and the difficulty of accurate mixing with the diluting fluid. It might also be pointed out that we have not insisted on a constant period of continence, and that the sperm count may vary significantly if this is not done. Nor have we taken steps to see that the interval between the examination of the three specimens is constant. It should be emphasized, however, that undue insistence on such details may seriously affect the husband's co-operation, which is essential for adequate clinical investigation. Although the variations we have encountered cannot be attributed to one or another of these causes with certainty, we have performed repeated counts on the same specimen of semen on a number of occasions and found that they agreed reasonably well. In one case, for instance, three separate counts on the same specimen of semen gave the following results: (1) 152 millions per ml., (2) 149 millions per ml., and (3) 155 millions per ml.

It would therefore seem unwise to make any attempt to assess male fertility, so far as sperm counts are concerned, unless at least three counts have been considered. Perhaps of more importance still is the contention that one is not justified in reaching any conclusion with regard to the effect of any form of treatment unless at least three counts have been made both before and after treatment.

Summary

A study of 226 cases in which three sperm counts have been performed has led us to conclude that a single count may prove misleading as regards both the fertility of the husband and the effects of any form of treatment of defective spermatogenesis.

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A CASE OF MASCULINOVOBLASTOMA

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Rottino and McGrath (1939) suggested the name "masculinovoblastoma" for a group of masculinizing ovarian tumours, consisting of large cells which often contain lipoid material and which resemble those of adrenal cortex or corpus luteum; such tumours are histologically distinct from arrhenoblastomas, which are also associated with clinical masculinization. Novak (1947) states that masculinovoblastomas include adrenal adenomas of the ovary and masculinizing luteomas, the relationship between the two being by no means clear, and adds that such tumours are extremely rare. Curtis (1946) was able to find in the literature only 16 cases in which he considered the diagnosis could be upheld. Iverson (1947) quoted 21 cases of masculinovoblastoma, six of which for various reasons he regarded as doubtful members of the group. Pedersen (1947) described another case