THE ROLE OF SPECIAL DIETS IN THE TREATMENT OF FEMALE INFECUNDITY

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Infecundity in seemingly healthy women is often associated with infective conditions whose eradication may bring about, or assist in, the restoration of fecundity (Lane Roberts *et al.*, 1948). However, refractory cases of infecundity combined with infective states are common. In these the infection cannot be eliminated either by antibiotics or by other and more drastic procedures; nor do they respond to the more specific methods for the treatment of infecundity. We have noted that this refractory state is particularly common in women aged 30 to 40 who are either distinctly overweight or frankly obese. The combination of overweight with refractory infecundity of this type could not be regarded as fortuitous; for, quite apart from our own observations, previous authors have emphasized the close association between obesity and sterility (Aschner, 1924; Bauer, 1934; McCann, 1934; Siegler, 1944; Guggisberg, 1946) and have advised the use of various reducing diets involving lowered energy intake.

In view of the generally accepted relation between nutritional state and reproductive function we also instituted dietary measures. In our cases, however, the strict rationing involved in the prevailing food situation, and the bacteriological findings, suggested a qualitative change of diet rather than lowered calorie intake only. These dietary measures assisted in the restoration of fecundity in a number of previously refractory cases, and are described below. The present report will be limited, however, to one section of these cases—namely, women in whom the major sterility factor discovered on investigation was cervical dysfunction associated with cervical infection and resulting in non-receptivity to spermatozoa ("cervical block"). This limitation recommended itself to us for several reasons. First, cervical block probably represents the most common immediate "cause" of sterility (Palmer and Palmer, 1945) in women aged 30 and over; secondly, the present investigations were suggested by findings in such cases; thirdly, the general condition of the cervix and its functional state are readily ascertained by precise laboratory and clinical methods (Lamar *et al.*, 1940; Barton and Wiesner, 1945; Clift, 1945; Viergiver and Pommerenke, 1946) so that corrective measures can be readily assessed. Lastly, the state of the cervix, though only one of the factors in genital function, often reflects the state of the reproductive system as a whole. Thus facts relating to cervical responses have a wide validity.

Subjects

The investigations were carried out during 1946–8 and concerned 88 women aged 30 to 40 with a history of primary or secondary sterility; in the latter group are included women who had conceived but aborted. All subjects sought advice because they desired children and not for any clinical complaint. They were women of widely different social status, and included many housewives with arduous

duties and some women with outside employment in addition. A few were doing work requiring considerable output of energy (e.g., market gardening).

Minor complaints or deficiencies were common in this series, particularly constipation, mild and transitory rheumatism, dental sepsis, nasopharyngeal catarrh, and sub-clinical infections of the urinary tract. Nearly all the patients complained of high fatigability and abdominal distension after meals. We have excluded from the present series any case with marked departure from the menstrual norm or with other than diphasic temperature records, or with any severe chronic illness.

Cervical Condition

In all cases the *initial cervical examination* was made during the late follicular phase—that is to say, during the days immediately preceding, and including, the shift of the waking temperature from the low to the high level. At this stage of the cycle the mucus secreted by the fecund woman is abundant and clear, while in the subfecund woman deficiencies of secretion are least pronounced, probably because of the temporary increase in cervical flow at this time. Conditions for invasion by spermatozoa are thus optimal, and failure of invasion at this stage may consequently be regarded as a reliable and definite sign of cervical dysfunction. In many of the cases the volume of the mucous cascade was abnormally reduced, and erosions, small occlusion cysts, or other clinical signs of cervical infection were present. In other cases the macroscopic appearance of the cervix was not demonstrably abnormal. The rheological properties of the cervical mucus, such as fibrosity (capacity to form threads), varied from the normal to the definitely abnormal without any constant relation to the appearance of the cervix. An invasion test was carried out in every case, the cervical mucus being brought into contact with fecund semen under anaerobic conditions according to the standard method (Barton and Wiesner, 1946). As mentioned before, the present group includes only cases of severe impairment of cervical receptivity (complete absence of sperm invasion, or sparse and shallow invasion with rapid inactivation of sperms). In about 70% of the cases the number of exfoliated epithelial cells and of polymorphs, which are scarce in normal ovulatory mucus, was increased, often to a density resembling that normally prevailing in the luteal phase.

The *second cervical examination* was carried out as close as possible to the onset of the next menstruation (late luteal phase). This stage was chosen because our experience has shown that infective and inflammatory processes in the cervix are exacerbated at that stage of the cycle. Pathological processes which may be masked during the follicular phase can thus be recognized, and the identification of pathogens is facilitated. The latter task is of significance in

the treatment of cervical block. It is true that in some such cases no organisms have been demonstrated which could be regarded as pathogenic by any standard. Conversely, not all infections of the cervix produce cervical block. But in the great majority of cases either undoubted pathogens (e.g., coagulase-positive chromogenic staphylococci, *B. proteus*) or organisms suspected of being pathogenic in this site (e.g., coliforms) can be recovered; their nature and their *in vitro* responses determine the choice of antibiotics. Furthermore, culture of the cervical mucus is essential in order to distinguish between infective and non-infective cervical block—a distinction which cannot be made by any other means.

During the pre-menstrual examination the cervix was exposed with the appropriate precautions against contamination (cf. Kuester, 1929; Hite *et al.*, 1947) and a loopful of cervical mucus, obtained after thorough dry swabbing from just within the external os, was planted out on warmed blood-agar slopes. Additional inocula on other media were made as required. The inocula were submitted without delay to the laboratory. In view of the great variety of organisms that may infect the cervix detailed bacteriological examination was carried out.*

The present series includes only cases in which pathogens or suspected pathogens were recovered, but excludes cases of Neisserian infection. The findings are illustrated by the results in 25 successive cases (Table I). This table

TABLE I.—Showing the Presumptive Pathogens Recovered from the Cervix in 25 Successive Cases of the Series. Reference to Presumptive Non-pathogens Commonly Recovered (e.g., *Staph. albus*; *diphtheroids*) is omitted

Case	<i>B. coli</i>	<i>B. proteus</i>	Chromogenic Staphylococci	<i>Streptococcus</i> <i>faecalis</i>	<i>Streptococcus</i> <i>faecalis</i>	Other Streptococci (incl. Haemolytic)	Pneumococci	Other Organisms
1					++++			Cl. Welchii ++
2	++							
3	+					+		
4	++++	++					+	
5	+					+		
6	+					+		
7	++	+				+	+	
8						+	+	
9			+			+	+	
10						+	+	
11	+	+				+	+	
12	++					+	+	Fusiforms
13	+			+		+	+	
14						+	+	
15	+	+		+	+			
16	++	+						
17	++		++					
18	+++	+				+	+	
19	+++					+	+	
20	++							
21	+		++					
22	+	+						
23	+++		++					
24	+++	+++						
25	+++	+++						

does not include the full variety of organisms recovered on culture, but it shows the predominance of infection by coliform organisms. In view of the precautions taken against contamination and of the heavy growth usually obtained, the cultures probably reflect the true flora,

*The bacteriological routine procedure employed anaerobic culture for 48 hours, followed by aerobic conditions for, usually, 18 hours at 37° C. At this stage it was decided, from the colonial characteristics and the Gram films of the primary culture, what further information was necessary to arrive at the true state of the cervical flora, and subcultures of colonies requiring identification were made on the appropriate media. MacConkey's medium and SS (as an enrichment medium) were generally used to identify genuine non-lactose-fermenters and were followed by the carbohydrates for two or three days for final confirmation. Nutrient agar was used for growing suspected genuine chromogenics such as *Staph. aureus* for the coagulase test; and *Ps. pyocyanea* is also easily identified by this means. Sensitivity tests with antibiotics were carried out in the appropriate subcultures.

though not necessarily the whole flora, of the blocked cervix in these cases. It is of course impossible to ensure that the loop will not in any circumstances take up organisms from the border between cervical and vaginal epithelium. The term "cervical flora" is thus subject to qualifications imposed by the technique. But while in some cases the vaginal films and vaginal inocula showed an atypical vaginal flora, the pathogens cultured from the cervix were not generally also found in the vagina, and vice versa. Thus coliform organisms are sometimes recovered from the cervix and even the urine, but not from the vaginal wall proper. It must also be added that an abnormal cervical flora may vary from cycle to cycle even to the extent of one pathogen being replaced by another without manifest cause.

Response to Antibiotics and Oestrogens

Impaired cervical receptivity that is combined with infection often responds to the administration of oestrogens, which stimulate cervical secretion and condition its receptivity for spermatozoa, provided that infection is first dealt with by suitable treatment—e.g., sulphonamides, penicillin, or other antibiotics used locally or systemically or both. The response is usually manifested not only in the favourable results of the invasion or post-coital tests, but also in the macroscopic appearance of the cervical flow. This becomes abundant and transparent, with reduced diapedesis of leucocytes.

The present cases were characterized by the absence of this response or by a partial response only. Notwithstanding the administration of antibiotics and oestrone (1.5 to 3 mg. in microcrystalline suspension per week for four to twelve successive weeks) the mucous flow remained scanty, or else it increased without becoming receptive for sperms. Again, pathogens could be recovered at any time during or after the treatment with antibiotics. Some of these cases had previously received local treatment for cervicitis, including cautery, with varying response of the local lesion but with persistence of cervical block.

Body Weight

As stated above, the present group is composed entirely of cases showing distinct overweight—i.e., more than 10% above the mean weight for age and height. The degree of adiposity varied widely (see Graph). In the pronounced

Graph showing changes in body weight under treatment. (The asterisk denotes date of commencement of diet.)

—: Woman aged 32; height, 5 ft. 2 in. (157.5 cm.). *B. coli* infection of the cervix. Lactose diet (Group I).
.....: Woman aged 31; height, 5 ft. 3 in. (160 cm.). *B. coli* infection of cervix combined with vaginitis (mixed infection, including *Trichomonas*). Simple sugar-free diet (Group II).
----: Woman aged 32; height, 5 ft. 3 in. (160 cm.). *B. proteus* infection of cervix. Supplemented by sugar-free diet (Group III).

cases adiposity—if the term may be used without prejudging the nature of the deposits—was most marked in the subscapular region, the waist, and the thighs. In the frankly obese women no specific distribution could be noted.

Therapeutic Methods and Results

In refractory cases it was at first intended to employ recognized and well-tried reducing diets involving severe restriction of calorie intake or to adjust the salt balance, but most patients were working too hard to be easily placed

on a severe reducing diet, nor could they spare the time for treatment in hospital. Most of them could not afford to purchase much unrationed protein, and it certainly did not seem safe to lower fat consumption below that provided by the rations. A different approach, suggested by the predominance of infections by organisms of intestinal type, was therefore chosen—namely, an attempt to reorganize the intestinal flora. This form of therapy has been widely advocated by previous workers for many different conditions, including genital infection. Three specific procedures were used in successive groups of patients.

Group I (Lactose Group)

The first method chosen (14 cases) was the *administration of lactose* (Lactose B.P., 3 oz. (85 g.) daily); for numerous investigators have agreed that this sugar, administered in comparatively small quantities, assists in the establishment of a favourable intestinal flora (for bibliography, see Robinson and Duncan, 1931; Robinson and Gilliland, 1937; Koehler and Allen, 1934; Koehler, Rapp, and Hill, 1935; Webb and Whittier, 1948; Rojas *et al.*, 1948); and has only mild side-effects, such as slight laxative and diuretic action (Hunt, 1931; Koehler, Rapp, and Hill, 1935). With the intention of enhancing the reputed action of lactose, ordinary sugar (sucrose), as the most ready source of fermentable carbohydrate, was eliminated from the diet. An additional reason for the experimental elimination of sugar and its replacement by lactose was supplied by the results of experiments in rats carried out by Whittier *et al.* in 1935. They placed paired groups of rats on diets containing lactose and sucrose respectively and found that the lactose diet prolonged the span of life compared with the sucrose diet; furthermore, the sucrose-fed animals developed significantly larger deposits of fat than those receiving lactose. It seemed possible that not only was lactose beneficial—as claimed by various observers—but also that sucrose was actively deleterious by promoting abnormal adiposity.

All our subjects, therefore, were instructed to avoid rigidly any article of food or drink containing sugar (biscuits, cake, puddings, sweets, etc.), and not to add sugar to food or drinks. Glucose and syrup were not allowed either. No restrictions were placed upon other foods, whether rich in carbohydrates or not; and the subjects were told to still hunger by eating more of permitted foods (e.g., bread, potatoes, etc.) than they did before being placed on the diet. The only medicament advised was mucilage where necessary to promote bowel action.

All subjects found the diet difficult to observe during the first few days and meals unsatisfying, but no ill effects upon working capacity were reported. Abdominal distension generally disappeared and subjective energy increased. Marked losses in weight occurred in all but three women of this group, the loss becoming apparent within one week of beginning the regime. The average loss was about 1 lb. (450 g.) per week, and the rate of loss was not clearly related to the initial weight. Weight continued to fall until a level approximately corresponding to the mean weight for age and height was attained. In some cases the weight remained stationary rather above this level in spite of the continuation of the diet.

The lactose diet was continued for at least four weeks before further steps were taken, re-examination being carried out in the second cycle after starting the regime and being repeated as required. In three cases spontaneous recovery of the cervix, with positive invasion tests, was then noted; but the dietary regime alone did not, as a rule, entirely restore cervical function even when body weight was much reduced.

Where invasion continued to be impaired (i.e., in all but three cases) treatment with antibiotics and oestrone was now resumed, the diet being continued and the procedure being in all essentials a repetition of that previously used without success. It was then that entirely different responses were recorded in a further six women, all of whom had shown loss of weight. The mucus assumed normal volume, transparency, and invadability in these cases; epithelial lesions healed without further intervention and without relapse in subsequent cycles. Conception occurred in four women, but male fecundity varied so much in this series that the conception rate does not reflect

the response as adequately as does the occurrence of a positive invasion test. Cervical recovery failed to occur in five cases, three of which had shown no significant reduction of weight.

Group II (Sugar-free Diet Without Lactose)

The second method chosen (65 cases) differed from the first solely in the omission of lactose; the subjects were simply placed on a "sugar-free" diet. All other instructions and procedures were precisely the same as in Group I. This regime was originally chosen to ascertain whether administration of lactose was an essential factor in the treatment of refractory cervical block.

The results showed unequivocally that lactose was *not* necessary for the desired results, and the group was then expanded. The sequence and rate of responses (reduction of weight; restoration of cervical function under repeat treatment with antibiotics and oestrone) resembled that in Group I so closely that no detailed description is needed. Cervical block was removed in 45 cases; conception occurred in 24; but, as in all such series, the conception rate is not an adequate measure of female fecundity, and the series includes cases in which treatment was but recently concluded. Incidental subjective responses (relief from post-prandial distension; decreased fatigability) occurred in this group as in the first, and in several cases infections of the urinary tract disappeared together with the cervical block. In this series there were several cases in which distinct cervical improvement took place under dietary regime alone. There were two cases in which no loss of weight occurred but the cervix responded to repeat treatment; in other responsive cases loss of weight had taken place. There were 18 failures (see Table II).

TABLE II

Dietary Group	No. of Cases	Cases Showing Loss of Weight		Cases Showing No Loss of Weight	
		With Cervical Response	Without Cervical Response	With Cervical Response	Without Cervical Response
I. Lactose group (sucrose-free) ..	14	9	2	—	3
II. Sucrose-free group (without lactose) ..	65	45	12	2	6
III. Supplemented sucrose-free group	9	6	—	—	3

Group III (Supplemented Sugar-free Diet)

In the present circumstances sugared foods supply a large proportion of the total energy intake of our subjects. Conversely, their elimination from the diet involves a severe reduction in energy intake unless it is balanced by increased consumption of unsugared foods. Most of the subjects in Groups I and II clearly compensated themselves by such adjustments. Hence it seemed that reduction in weight and restoration of fecundity could occur without significant reduction of energy intake. But it seemed desirable to test this conclusion by specifically prescribing to a number of subjects a sugar-free diet which did not involve for any case a decreased calorie intake and for most cases in fact procured a significant increase.

The composition of the diet in this group (9 cases) was dictated, first, by our intention to provide a diet which in certain experimental animals, and so far as is known in man, is adequate for maintenance and for reproduction (whole grain, milk); secondly, by the limited variety and quantity of foods available to patients with small incomes; thirdly, by the need to avoid additional work—i.e., in procuring or preparing food.

The diet prescribed *excluded* (1) all foods containing sugar, as in Groups I and II; (2) breakfast cereals and other foods prepared by toasting. It *included* explicitly all rationed foods except sugar: bread (85% extraction), oatmeal, unrationed vegetable oil, fruit, fish, potatoes, and yoghourt, which is unrationed and available to anyone living in London. The subjects were instructed concerning the purpose of the regime. Although, with few exceptions, they were not asked to weigh their food or to adhere to specific menus, they were clearly told the approximate minimal quantities which they were to consume per day.

The general and the cervical responses resembled those seen in Groups I and II. Loss of weight occurred at about the same rate as in those two groups. In three patients the weight

remained almost constant. Cervical function was restored in six who had lost weight, and conceptions have occurred so far in two. This group, like Group II, contains a number of recent cases, so that the incidence of conception cannot yet be assessed.

As stated, the energy intake of several women of Group III was higher during the regime than before. Increased intake, in spite of the exclusion of sugar, was facilitated by the peculiar food habits not uncommon in obese women. Before treatment they ate no potatoes, hardly any bread, and very little fat—all foods which they believed to be fattening. Being childless, they did, however, consume their own (and sometimes their husband's) sweet rations, and quantities of cakes, biscuits, stewed fruits, etc. Furthermore, they did not bother to prepare meals for themselves when their husbands were out, so that their "elevenses," lunches, and teas consisted quite often of a cup of tea or coffee with a slice of cake. When they were taken off sugared foods and ordered to eat bread, oil in addition to their fat ration, oatmeal porridge, yoghurt, and so on, they more than made up for energy intake surrendered with sugared foods. The subjects were not in hospital, so precise figures concerning calorie intake cannot be submitted; but in Table III gain and

TABLE III.—Showing Loss of Energy Intake through Exclusion of Sugared Foods by a Subject of Group III, together with Energy Intake from Additional Foods Prescribed to Balance this Loss*

A. Loss per Week through Exclusion of Sugared Foods			
Sugar (8 oz.: 227 g.)	..	..	860 cal.†
Cake (purchased) (28 oz.: 794 g.)	..	..	2,800 "
Biscuits (16 oz.: 454 g.)	..	..	2,176 "
Jam (8 oz.: 227 g.)	..	..	560 "
Sweets (3 oz.: 85 g.)	..	..	450 "
Flour used in puddings (about 7 oz.: 200 g.)	..	..	680 "
Total	..	..	7,526 cal.
B. Gain per Week from Prescribed Minimum Intake of Specified Foods			
Oatmeal (14 oz.: 397 g.), taken as porridge and girdle cakes	..	..	1,400 cal.
Yoghurt (14 bottles, estimated at about 100 cal. each)	..	..	1,400 "
Additional bread (28 oz.: 794 g.)	..	..	1,960 "
Potatoes (3 lb.: 1·36 kg.)	..	..	2,700 "
Vegetable oil (20 fl. oz.: 568 ml.) taken in salads and for cooking	..	..	5,100 "
Total	..	..	12,560 cal.

Positive balance, per week, 5,034 cal.

* The figures do not take into consideration meat, fish, cheese, and other foods which were not significantly affected by the regime; nor do they reflect increased consumption of fruit and vegetables. The figures relate to the average consumption during a period of three weeks at the beginning of the regime. The subject, aged 32 years, height 5 ft. 3 in. (160 cm.), weight 157 lb. (71·2 kg.), lost 6½ lb. (2·7 kg.) during this period.

† Calorie values obtained from "Nutritive Values of Wartime Foods," Med. Res. Coun. War Mem. No. 14, London, 1945.

loss of energy intake are shown relating to a particular subject. From this it will be seen that in this clinical condition and in the prevailing food situation an increased calorie intake is compatible with a significant decrease in weight and an increased chance of recovery from cervical block.

Supplementary Notes and Discussion

1. *Control Data.*—Two groups of control data for the present series are available. First, the cases were unsuccessfully treated by oestrone, antibiotics, and sometimes local applications before institution of the diet. Experience shows that mere repetition of such treatment after an interval, and without intervening measures, rarely brings about success if it has failed the first time. The cases thus constitute their own controls. Secondly, properly organized therapeutic measures could not be instituted, or were interrupted for incidental reasons, in 9 patients. When these were seen again after intervals varying from two to six months restoration of cervical function was noted in but one case. Rapid spontaneous recovery without change in environment thus being rare, the regime appears to have contributed materially to the restoration of cervical function.

2. *Alterative Effect of Diet.*—Previous workers found that infecundity in overweight women responds well to reduction of weight by decreased energy intake, by treatment for fluid retention, or by both. In our cases, too, the effect seems to be related to loss of weight. However, we

avoided any attempt to procure a negative energy balance. In some patients energy intake was possibly decreased simply by withholding sugared foods; in others, however, intake was not sensibly reduced, or was even raised. Nor did the patients produce a negative energy balance by increased exercise. In fact, in some of them the amount of work was deliberately reduced; for we are under the impression that such reduction, by imposed periods of rest, promotes recovery in women of this age group who have been exposed to continuous or excessive physical strain. It may thus be deduced that in such cases loss of body weight was due to a change in metabolism.

3. *Metabolic State and Infective Process.*—This alterative effect may be responsible for the subsequent response to treatment. It is uncertain whether the response was related to an increase in general resistance or to a more specific action, or both; certainly general improvement in health occurred in many instances during the dietary regime. Resistance to infection is of course known to depend on nutritional conditions (Cannon, 1942; White, quoted by Duncan, 1947), and is lowered by specific metabolic disturbances (e.g., diabetes mellitus). But while alteration in the rate or the nature of metabolism appears to have favourably affected the infective process the connexion between infection and metabolic state in these cases cannot be regarded as a one-way relationship. Thus we have noted that the resumed treatment of the infection while maintaining the diet often accelerates reduction of body weight. Furthermore, the case histories show that increase in weight, and even rapid development of obesity, often dated from, or followed upon, the first signs of genital infection or the infection of the urinary tract which not infrequently precedes cervicitis. The data are compatible with the suggestion that metabolic disturbances resulting in overweight and infective conditions of the type described are subject to mutual enhancement whatever the mode of origin may be.

4. *Metabolic State and Response to Oestrogens.*—The restoration of cervical response to oestrogens may not represent an independent effect of metabolic changes but merely reflect the elimination of the infection. This interpretation suggests itself not only in view of previous findings already referred to but also because of other observations (unpublished). These show that in infecund women the reactivity to sex hormones (measured, for example, by uterine response to oestrogens and by endometrial or thermal response to progesterone) may be impaired by unspecific infections even if these are not localized in the reproductive system. Also pyometra, which commonly develops in aged rats, is often associated with suppression of vaginal response to oestrogens; the response may be restored by hysterectomy. It should be recalled, too, that the response to another hormone—namely, insulin—may be impaired by infective conditions.

5. *Role of Sugared Foods.*—The only common factor in the three diets we employed was the exclusion of sucrose (with the exception of that occurring naturally in fresh fruit), and we are inclined to regard this as the essential factor. It seems likely that the high intake of sugared foods adversely affected metabolism either directly or indirectly (e.g.—through promoting an unbalanced intestinal flora). The suspected effect of sugar may of course be conditioned by the form in which it is taken and which determines its availability for intestinal agents, and may be related to the diet as a whole (e.g., to the protein-carbohydrate ratio).

6. *Effect of Crude Sugar.*—It seemed also possible that the adverse effect of sugared foods depended upon the use of highly processed sucrose, but the lactose used was also highly processed, yet it appeared to be harmless. Furthermore, 12 women were placed on a diet corresponding to that of Group II but received about 12 oz. (340 g.) of crude cane sugar per week. This diet did not evoke any loss of

weight or other response. Sugared foods were then entirely excluded from the diet, and the usual response occurred in these cases. The data, so far, certainly do not suggest that highly processed sugar is any better than the crude substance.

7. *Age Factor*.—The relationship between refractory infective conditions, metabolic state, and response to oestrogens is further complicated by an age factor, the threefold disturbance being comparatively less common in infecund women under 30: its incidence seems to rise, like that of obesity in general, during the fourth decade of life. The complex here discussed represents one of the modes by which fecundity declines.

8. *General Notes*.—The use of sugar-free diets is not suggested for cases of obesity in general, for our experience is entirely limited to infecund women in the reproductive phase of life. Also, the syndrome involving refractory genital infection, overweight, and lack of response to hormones may be determined by specific and topical conditions such as the prevailing food restrictions combined with the demand made upon the physical resources of women in this country during the past years. Nevertheless, we are submitting our findings because the dietary measures described have been of great practical assistance to us in our work; and in recent months dietary measures have been employed in every suitable case from the very beginning of treatment in order to save time.

Summary

Refractory cervical block is a common cause of infecundity in overweight women aged 30 to 40. It tends to respond to treatment by antibiotics and oestrogens if loss of weight is first procured by dietary measures. Suitable diets which do not interfere with the routine of the subjects are described. Their main characteristic is the exclusion of sucrose, with concomitant increase in other foods chosen to produce a diet adequate for maintenance and reproduction within the limitations imposed by rationing.

The bacteriological investigations for the present series were carried out by Dr. R. C. Matson, pathologist, Royal Surrey County Hospital, Guildford, to whom our thanks are due for help and advice on many occasions. His routine procedure is summarized in the footnote. We are also indebted to Mr. A. L. Bacharach for discussion of nutritional aspects of this investigation, and to the Scientific Adviser, Ministry of Food, for supplying crude cane-sugar for issue to subjects.

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THE BIOLOGICAL ASPECT IN TREATMENT OF THE INFERTILE MARRIAGE

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At the present day, when so many women seek advice with reference to the infertility of their marriages and so much investigation is carried out in an attempt to elucidate the causes, the criticism might be offered that most of our energies are spent in investigation and little in treatment. Nevertheless, many of our lines of investigation seem to have a direct curative value—as, for example, it would appear to be established that the performance of a tubal patency test has a curative as well as a diagnostic value: Green-Armytage (1943) has recorded a 43% success rate following the simple process of salpingography. It is not clear how this process achieves these results, but speculation upon figures quoted suggests that there is a direct relationship between the two. So many cases of immediate pregnancy following upon the simple procedure of endometrial biopsy have been reported that it is impossible to avoid the conclusion that here also the results are not merely accidental.

Reviewing treatment from the time-honoured method of dilatation of the cervix and curettage to the present-day methods of demonstrating tubal patency (salpingography and insufflation) and the surgical procedures of salpingostomy, it is at once apparent that most of our means of approach are mechanical. This is what might be expected in the present mechanical age and from the fact that the problem of the infertile marriage occupies the minds of surgeons rather than physicians.

Now that the role of the hormones of human gestation is becoming clearer and the endocrinologists are turning their attention to the problem, it is likely that the pendulum will swing a little away from the mechanical aspect towards the medical and biological side.

Four Important Questions

In investigating an infertile marriage we are concerned with four major questions: (1) The husband, his potency and the quality of his semen. (2) Ovulation. (3) The pathway which the sperms traverse to reach the ovum; and here we may consider two subdivisions—(a) the cervix and the influence of its secretions on sperm migration; (b) the Fallopian tubes. (4) Nidation or embedding of the ovum. In my opinion, the importance of nidation of the ovum has not been sufficiently stressed, and treatment based upon the assumption that many cases of infertility result from difficulty experienced by the ovum in embedding itself in the endometrium has proved to be successful in an appreciable number of my cases.

Since treatment based on the assumption of faulty nidation is purely medical and can be carried out with little inconvenience to the patient, it has gradually become my practice of recent years to initiate medical treatment aimed at securing firm implantation of the ovum in practically every patient who consults me with reference to infertility and in whom there is no gross pathology. Medical treatment can be undertaken while the patient is awaiting the propitious moment for such tests as the post-coital test, endometrial biopsy, and the tubal patency test and while the husband is being investigated by a seminologist.