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Dysmenorrhea : considering the etiology and treatment

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DYSMENORRHEA

Considering
the
Etiology
and
Treatment.

J. M. Coletti

A
Senior Thesis

Presented
to the
Faculty of the University of Nebraska
College of Medicine
in
Partial Fulfillment
of the
Requirements
for the
Degree
of
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INTRODUCTION

Introduction

The study and practice of medicine presents many obstinate problems, of which the menstrual disorder dysmenorrhea is one of the most prominent. The seriousness of this situation is further accentuated when we recall that dysmenorrhea is not a recent discovery in medicine. Hippocrates described it twenty-five hundred years ago. From that time up to the past few years dysmenorrhea has been considered a minor ailment. Recently this condition has been considered a major one by our noted gynecologists.

One finds, in the practice of medicine, that 50 per cent of a physicians patients are women, and statistics show that 46 to 75 per cent of women suffer from dysmenorrhea. The average practitioner does not have adequate knowledge of etiology and treatment of this disorder.

The main reason for its having been considered so lightly is that the average woman considered it immodest to converse on this subject. Even at the present, many of our women are reluctant to make mention of their menses. However, with the advent of a "broad-minded society" this ancient pride, much to society's benefit, is being cast aside and now these problems are being discussed with phy-

sicians, permitting, therefore, a thorough study of this abnormal phase of menstruation. With this feeling of freeness existing between patient and physician, proper research has been instituted in hopes of determining the exact cause and accurate treatment of dysmenorrhea. Lack of knowledge of this phase of gynecology influenced my choice of subjects.

Dysmenorrhea or "painful menstruation" as Dorland terms it, is one of the many intangible conditions we have to deal with in medicine. Numerous theories as to its etiology and treatment have been advanced, but none have been satisfactory. The results, indeed, have been very disappointing even though the literature in connection with it is voluminous. This massive amount of knowledge has only resulted in new theories of etiology, new classifications, and new terms, but with little progress in regard to pathology, accurate etiology and treatment. Discoveries and real contributions in modern medicine have not been numerous; yet a few have lent a happier color to many unsettled problems the physicians must face. To this group we must add dysmenorrhea. Even though the histology of menstruation, and the elaborate studies on ovulation and female sex hormone have been given us, dysmenorrhea remains as much a "riddle" today as it was fifty years ago. This statement is true when statistics of earli-

er and present time are compared. "In 1877, Jacobi noted that 46 per cent of women complained of menstrual pain; and in 1927, fifty years later, in a study of college women and nurses throughout the United States, we found 47 per cent similarly afflicted." (1)

"Some authorities estimate as high as 75 per cent of our American girls suffer from dysmenorrhea." (2) This seems quite high in comparison to results obtained by others, but geographical distribution may be a factor in etiology. It has been said that the percentage is highest in those who lead a sedentary life. The girls who have the advantage of out-door life and exercise run a considerably lower percentage.

Be the percentage what it may, there is scarcely a school, office, store or factory that is not interfered with on account of young women being either reduced in efficiency or entirely incapacitated once a month from this ailment. Dysmenorrhea is perhaps the most troublesome of the menstrual disturbances with which women experience. Some suffer from one to several days. In most cases the suffering is so severe that it constitutes a monthly torture, which aside from the immediate pain leaves the patient worn and weak for days afterward, and she lives in constant dread of the next menstrual period. This continued

recurrence of pain and mental depression often leads to neurasthenias and malnutrition. Though some authors consider dysmenorrhea of minor importance others believe it important both from standpoint of the patient and the economical value.

Generally speaking dysmenorrhea is referred to as being only painful. "However, there are usually accompanying it a number of symptoms due to the functional disturbances in remote organs because the central and peripheral nervous system also take part in the menstrual process. These disturbances occurring in the stomach cause indigestion, in the intestines give rise to diarrhea or constipation, in the heart are followed by palpitation, and when they occur in the peripheral nerves of the head result in headache." (3)

It is a notorious fact that most of our crimes for which women have been tried have been committed during the menstrual period. Graves (4) contends that menstruation should not be accompanied by pain, physical or mental disturbances; and yet, a large number of our women suffering mental distress from marked discomfort to pain and despondency, which may be as great as that suffered by the average woman during her first confinement. This also is of great economic importance, and stresses the fact that dysmenorrhea is of major importance even though

many noted physicians place it in the category of minor ailments.

The unfounded advice given by mothers, sisters, and friends (who always mean well) makes the proper approach to this condition, so far as the treatment is concerned, very difficult. This leads to neglect. If it occurs in young girls the parents tell them that the periods have not yet been properly established and later, when it does not improve, that it will do so after marriage; and after this has occurred with still no relief from pain and psychic disturbances, they then encourage the unfortunate woman with the statement that following the birth of a child it will surely cease. The cycle goes on until the patient, in desperation, finally goes to the physician for relief. However, in most cases, it is of no avail because the condition has been of such long duration that the meager treatment that he can give is of little or no benefit.

Dysmenorrhea, by most authorities, has been accepted not as a disease in itself, but as a symptom. It is caused by a variety of conditions and is a symptom of many pelvic diseases. However, no one organic lesion has been shown to be the essential or sufficient cause of menstrual pain; for every condition so considered at one time or another has been found to exist in some instances without

accompanying menstrual pain. This leads us into a complicated group of classifications; each man having proof for his own efforts.

The classification given by Graves (4) seems to me, the most logical. It is as follows:

1. Neuralgic or Ovarian Dysmenorrhea.
2. Congestive or Inflammatory Dysmenorrhea.
3. Obstructive or Mechanical Dysmenorrhea.
4. Membranous Dysmenorrhea.

The field is covered very adequately when one considers the overlapping of the above facts. However, I wish to add to this classification the following factors:

1. Endocrine Dysfunction Dysmenorrhea (partially covered in numbers 1 and 4).
2. Traumatic Dysmenorrhea.
3. Pyschic Dysmenorrhea.
4. Allergic Dysmenorrhea.
5. Roentgenological Dysmenorrhea.

Of course, these have not been accurately demonstrated to everyone's satisfaction, but the meager knowledge and proof already collected seems quite convincing. I have no definite reason for attempting a classification of dysmenorrhea, but every classification I have read, other than the primary and secondary dysmenorrhea, has ^{seemed} too limited or

complicated. I feel that the above classification should replace the latter mentioned (primary and secondary), because there is a certain amount of overlapping that would complicate and confuse us all. However, when the etiology is discussed no classification will be followed.

The exact cause of dysmenorrhea is still unknown. Consequently, the inadequacy of all the theories of its causation makes it a "bug-bear" of gynecology. With this in mind, I shall attempt to present a review of the most important theories propounded during the last twelve years. Even though many of these theories are only interesting from the standpoint of literature, I believe that they have some practical value in that when a physician attempts therapy he should use those therapeutical agents that take into consideration any of the etiological factors I will soon mention. This has been mentioned with only one thought in mind, in as much as, I believe that dysmenorrhea is not a condition which can be treated with any specific agent but by a combination of them. After having read all theories of etiology and treatment of dysmenorrhea written in the past twelve years, I feel that this condition is not due to one but to a combination of the etiological factors to be discussed.

Before proceeding with the etiology I wish to present

three axioms that the physicians should employ when he is confronted with a patient suffering with dysmenorrhea.

These were taken from Graves (4). He should:

1. Determine the abnormal conditions present in that particular case.

2. To form an estimate as to how important each factor is in that case.

3. To treat the patient properly.

ETIOLOGY

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ETIOLOGY

I. Mechanical Obstruction:

The theory that mechanical obstruction of the menstrual flow is the cause of dysmenorrhea is the oldest we have. It was thoroughly expounded upon by Macintosh in 1832--even Hippocrates 2500 years ago described it. It had achieved a general acceptance for many years and treatment was instituted along that basis. This theory was endorsed by the early leaders in gynecology. For example, Marion Sims said "there can be no dysmenorrhea if the canal of the neck of the uterus is straight and wide enough to allow free passage of menstrual blood." (20) The other men in gynecology conceded their acceptance of this theory by fact that they treated it by dilatation. As the years have passed this theory has been pushed into the background; occasionally finding someone who cures a patient by simple dilatation of the cervical canal and he in turn re-introduces the theory of mechanical obstruction only to have it fade as in the past. The pain produced results from violent contractions of the uterus brought about by a damming back of the menstrual flow in the uterine cavity due to some obstruction. Graves (4) states that "this stagnant blood becomes clotted and the uterus in an attempt to rid itself of this foreign body sets up violent contractions. As a

result pain originates from the passage of these blood clots through the narrowed cervical canal." However, it is now known that the menstrual blood does not clot. (3, 5, 9, 18, and 45) We also have in the obstruction theory, in conjunction with the damming back of the menstrual flow, the added feature of the swelling of the endometrium which may be either premenstrual edema or a true pathological hypertrophy, which is supposed to increase obstruction by narrowing the internal os. This hypertrophy may be explained on the endocrine basis, hence stressing the nearly impossible task of accurately classifying theories of etiology of dysmenorrhea. Gebhard describes an endometritis dysmenorrhea, in which the mucosa, at the time of menstruation is greatly thickened and filled with a finely clotted exudate. He thinks this exudate presses on the uterine nerves and produces dysmenorrheic pain. His conclusions are questioned by many. Graves says that "the clotting of the blood is due to abnormal chemical influence of the ovarian inner secretion". (4)

Theilhaber denies that the obstruction theory has anything to do with dysmenorrhea, but instead attributes it to a spastic contraction of the circular muscles around the internal os, evoked by an increased irritability of the uterine nervous supply.

The obstruction theory was very much accepted because the first few cases treated by dilatation of the uterine canal brought relief. However, this theory has now been considerably shaken by numerous observations showing on one hand, that dysmenorrhea may occur in the entire absence of any mechanical obstruction, while on the other hand, it may be absent when a greater or lesser degree of obstruction is present. It has been convincingly shown in cases of dysmenorrhea, supposedly due to mechanical obstruction, that a uterine sound could be easily passed through the cervical canal into the uterine cavity at the height of dysmenorrheic pain without meeting any resistance and consequently allowing the free passage of menstrual flow with dysmenorrheal pains still existing. This would certainly disprove, or tend to disprove, the obstructive theory. To further show this, it has been demonstrated that the "normal rate of menstrual flow, with all conditions being normal, is two-thirds drops of blood per minute". (5) This flow is very slight when one actually thinks about it, and it is difficult to conceive of such a small flow of blood producing such colicky pains witnessed in dysmenorrhea.

The main argument in favor of the obstructive theory is that many cases of dysmenorrhea said to be due to this factor have been entirely relieved by dilatation of the

cervical canal. This argument, I feel, in the face of so little evidence---granting that relief of dysmenorrhic pains is not to be accepted as a cure---is overshadowed by two phases cited above; mainly, that at the acme of the dysmenorrhic pain a uterine sound can be passed without relieving the pain, and that the normal rate of flow of blood, two-thirds drop per minute, is too small a stream to produce the pains of dysmenorrhea.

II. Hypoplasia:

While the obstructive theory of dysmenorrhea was being condemned, another one came into vogue--this being the hypoplastic theory. Hypoplasia is a "condition of defective or incomplete formation" (Dorland) This theory was regarded very highly when it first appeared, but later it was severely questioned. With lessened credence in the obstructive theory the view was taken that hypoplasia of the uterus was the cause of dysmenorrhea. The exact physiology of this was not explained adequately by anyone when it first appeared, but later Victor Schultz proposed an explanation which was regarded very highly by Graves. (4) Schultz said that normally the infantile uterus transformed into the mature form gradually. During this change the connective tissue in the outer layer of the uterus is very abundant and with radial processes is converted into muscular tissue. If this failed to happen then at each menstrual

period as uterine contractions begin no muscle is present to "stretch" and as a result this connective tissue is put under a strain which in turn stretches serous membrane covering the uterus and pain would result due to the fine nerve endings being irritated from this "stretch". Schultz in several hundred cases showed dysmenorrhea only to be present in these cases where hypoplastic genital organs existed. The spontaneous cure which one frequently sees following childbirth he says "signifies structural changes in the uterine wall". (4)

Some link hypoplasia and the obstructive theory together. They say that the hypoplasia produces anteflexion of the uterus and that the latter accounts for the mechanical obstruction. "This condition of anteflexion is seen in both fetal and postnatal life." (5) It is also known that anteflexion is present with fully matured uteri. If one were to rely on clinical evidence no definite proof could be clearly shown for it, and on the other hand, much proof against this theory can be shown. Even when the uterus is hypoplastic as seen in the infantile uterus, there is often no menstrual pain, while on the other hand it has been shown that menstrual pain is present where the patient has a normal uterus. If this is summed up no definite conclusion can be reached. The chief

factor against the developmental theory is that dysmenorrhea is often an acquired disorder. A careful history often discloses that the patient following the onset of puberty, menstruated normally and without pain for a long time then she developed these colicky pains. Novak and Reynolds (5) reports the above to be true in over one-half of their cases. Even if their reports are true it is difficult to explain dysmenorrhea as being due to developmental factors. Novak says that no definite explanation of the pain has been given to date. However, Graves (4) accepts Schultz's description of the pain producing mechanism found where the hypoplastic uterus is present.

III. Psychogenic:

Nothing is more certain than that the psyche plays an important role in the production and perpetuation of menstrual pain. Many men such as Menge (31), Crossen (18), Graves (4), Novak (5), and others believe most all cases of dysmenorrhea explainable on this basis.

This is further strengthened by observations made by Novak (5 and 15). He has definitely proven that dysmenorrhea is brought about by improper sexual relations. He cites case after case in which a young and apparently normal woman who up to the time of her marriage was having regular

menstrual periods, free from pain; and who, shortly after marriage began having dysmenorrheic pains with each period. Upon careful questioning of these patients he found that in each case improper sexual relations precipitated this condition. Novak then instructed both husband and wife to right their sexual difficulties. When done these patients were cured of dysmenorrhea. His observations are very impressive. Edelberg and Galant (14) state that most cases of dysmenorrhea are sexual in origin, but other factors must not be neglected.

Mental shock at the menstrual periods or repugnance at the offensiveness of the menstrual discharge often produces a dysmenorrheic career. It is not uncommon to unravel a story from a young girl that she feels ashamed of the odor given off from the flow, or the bulging of her dress from the pad, etc. Many such stories are often encountered by the physician who comes in contact with women suffering from dysmenorrhea.

These patients also show extreme nervousness and irritability which favors the psychogenic theory. The question is brought up whether the dysmenorrhea is secondary to the neurotic condition, or vice versa. Most of the gynecologists place most confidence in the neurotic elements. Graves maintains "that once the pain is established the patient becomes nervously exhausted during the menstrual period, until

there comes a time when the patient hardly recovers from one period before the next one is upon her, and in this way the nervous irritant is constantly maintained. The pathologic mental habit then becomes fixed and the patient develops into a confirmed neurotic. These girls are usually brought to the doctor because of extreme nervousness but with questioning the exaggerated symptoms are exposed. This type of patient responds very well to mental therapy properly instituted".(4)

These psychogenic factors do not require psychoanalysis by a psychiatric expert but can be excavated by a careful, detailed gynecologic consultation. As with other psychoneuroses this condition can be cured as soon as the patient appreciates that this condition is due to subconscious reflexes rather than any organic disease of the generative organs. These authors, Novak and Reynolds (5) reported a series of 168 cases treated along this line with complete cure in 71 and marked improvement in 89.

Many gynecologists do not carry these methods out and consequently get poor results. Merely to stigmatize these patients as "hysterical" or treat them with superficial "psychology" is inadequate and unsatisfactory. The gynecologist must win the patient's confidence to such an extent that she, herself, will grasp the logic explanation

which the physician must take time to give. Once the patient's mind is so ventilated, these mischief-provoking fears and anxieties lurking in her sub-conscious will die a natural death.

In this connection prophylactic measures can be taken to teach the young girl the naturalness of the menstrual phenomenon, and particularly that it should not interfere with her normal activities. The mother is the logical instructor in this case. She will however, be ill-fitted for this purpose if she has suffered with dysmenorrhea, because a powerful suggestive factor at once is brought into play on the daughter, who may come to look forward to menstrual period as a time to expect suffering and discomfort. This then is important to the physician, college and high school physical education teachers having to deal with the physical health of the growing girl. (13)

The undoubted role of the psychogenic factor in many cases of dysmenorrhea at once brings into question the reliability of observations as to the therapeutic results after various forms of treatment, whether medical or surgical. For example, dilatation of the uterine canal frequently yields excellent results. Another factor that favors this theory is that according to most psychiatrists the greatest

percentage of neuroses is found among the women.

IV. Constitutional:

There are other factors which may be concerned with dysmenorrhea. For example, there is little doubt that in some cases it is merely the reflection of a condition of constitutional or nervous depravity entailing a lower threshold of pain. (2,4,5.) Crossen (18) says "that there is hyperesthesia or marked irritability of the nerves of the uterine mucosa and muscles, especially in the neighborhood of the internal os. This is noticed when the uterus is sounded and especially on dilating the internal os without anesthesia. It is indicated also by the painful muscular contractions or uterine 'cramps' occurring without apparent cause." The theory that hyperesthesia of mucosa and muscles as being due to nutritive disturbance, affecting the nerves and other tissues, seems to be a very tenable one. It explains adequately the various phenomena observed; and shows why the symptoms may persist to a greater or lesser extent after removal of the obstruction at the internal os, and after removal of hypoplastic mucosa. It shows why measures directed toward improving nutrition and allaying nerve irritability will sometimes produce decided improvement without any local treatment. In short, it explains what has already been worked

out clinically--that narrowing of the canal and thickening of endometrium are simply complications that may or may not be present. When they are present they aggravate the trouble and require treatment. But unless the nutritive disturbance of the uterine muscle and mucosa is also improved sufficiently to restore the nerves to fairly normal condition, the pain will continue to a considerable extent. The marked effect of pregnancy and poor nutrition in these cases points to its being largely explainable as a nutritive disturbance. Perhaps this nutritive element could explain the hypoplastic or "infantile uterus". It has also been shown by Novak that many women with infantile uteri are poorly nourished and this may be the explanation of the presence of the defective uteri. However there is as much evidence to either disprove this as well as prove it so too much faith cannot be placed on this assumption. It would seem therefore that the two conditions--imperfect development and neurotrophic dysmenorrhea--are due to poor nutrition largely at a certain period of life, that of puberty. Both Crossen(18) and Novak (5) state that the victims who suffer most from dysmenorrhea are usually those women who during puberty, were poorly nourished from a physical and developmental standpoint. This condition is usually very apparent when the patient goes to

the physician and is suffering with dysmenorrhea. Consequently the physical development should not be sacrificed to benefit mental development. This is to imply that at puberty, the school age, too much emphasis, by many parents, is placed on the absorption of knowledge with a neglect of the physical side of her life. It is in this type of patient that the slight amount of menstrual discomfort frequently present is magnified into an actual pain.

Many cases of dysmenorrhea can be cured by building up the general health of the patient with no direct treatment of the pelvic condition. This is done by insisting on proper general hygiene, especially exercise, with little or no limitation because of menstrual periods. This is important and should always be watched for and treatment stressed.

V. Endocrine Factors:

Up to the present no theory explaining dysmenorrhea has been accepted. With the advent of endocrinology a new approach as to the exact cause of dysmenorrhea has been made possible. Much work in endocrinology has been done which has produced considerable convincing data. Even though not definite, the value of endocrinopathy must not be underestimated. The exception to this being the omniscient manufacturers of various organ extracts. There is

no definite endocrinopathy associable with dysmenorrhea, although the intimate relation of the pelvic organs with most of the endocrine glands makes it at least, theoretically possible. (5,6) Bercovitch (3) says "when no gross pathology in the pelvis is present, the dysmenorrhea is endocrine in nature." He has demonstrated that ninety-three per cent of patients complaining of dysmenorrhea, examined in the Mayo clinic have been found to possess apparently normal pelvises. This type of dysmenorrhea he says, can be attributed to endocrine disturbances. Now let us see how endocrine disturbances may cause it. It is considered generally, that we may regard the ductless glands, through their hormones, as being the regulating mechanism of the function of the body. It is well-known that all these endocrine glands do not act by themselves individually, but by a correlation through which, if one gland becomes upset, the others react very quickly in an endeavor to compensate the disturbance induced in the organism by the former. This is seen in cases of short, or tall people, fat or thin people, etc.

According to Henricus and Lieb (3) and Gemmell (11) the myometrical motor nerves filaments penetrate the muscle sheaths and cause normal rhythmical contraction and relaxation of the uterine muscle during the entire menst-

rual cycle and so keep the normal circulation of the uterus. These contractions should be painless and should they become intensified will produce pain. The most common time for intensification is before or at the commencement of the menstrual period. Improper hormonization will result in an overstimulation of these nerve filaments and produce the painful hypertonic contractions or spasm of the uterine muscle, especially at the cervix. This produces a dilatation of the vessels of the mucosa of the uterus and engorgement results. We then have congestion and swelling of the mucosa which produces profuse bleeding with "clots" and eventually spells pain. The method of improper hormonization should be understood and to grasp this we must recall the two important branches of the vegetative nervous system--the sympathetic and the autonomic (vagus). The vagus supplies the lungs, heart, liver, pancreas, and small intestine. The sympathetic supplies the large intestine, bladder, uterus, and adnexa through the pelvic plexus. The vagus is the driving force whereas the sympathetic is the inhibiting one.

The thyroid and pituitary stimulate the vagus while the adrenals and the ovaries stimulate the sympathetics. A mention of a few of the more recognized hormones here would simplify matters considerable. From the ovaries

we get Corpus Luteum which is essential for menstruation and conception--via Progestin. Along with this there is thought to be given off another hormone called Theelin and when increased in the blood over its normal level, produces spasm of uterine musculature and hence pain. This hormone is thought to be present only during the pre-menstrual and early menstrual phase of menstruation. This is based on the fact that Theelin can be chemically isolated only during the pre-menstrual and early menstrual periods. The time intervening between periods has been fruitless so far as demonstration of this product is concerned. Novak and Reynolds(5), in experiments on rabbits, have shown that Theelin, the female sex hormone causes spasmodic contraction of the uterus, and hence is possibly the source of dysmenorrhoeal pains. The hormone is present during the pre and early menstrual phases--being derived from maturation of the Graffian follicle. (45) It is also seen that following delivery after pains persist for a time while the female sex hormone is in high concentration in the blood. This explains that the spasmodic contraction of the uterus is possibly endocrine in origin. Bercovitch (3) and Bland (45) question that both thyroid and pituitary secretions inhibit ovarian and adrenal secretions, if in excess, but

instead favors the presence of Progestin and Prolan. He states that these two endocrine products tend to balance hyper-ovarianism and adrenalism by becoming more active themselves. Progestin has been proved to ovarian in origin, and Prolan to arise from the Anterior body of the Pituitary gland.(45) A few experiments in which the anti-female sex hormone Progestin and Prolan have been used are very impressive, but no appreciable results have been attained as yet. Consequently, this cannot be properly supported until further experiments are carried out. (5)

By an illustration of this improper hormonization we can see the sequence of events. A young girl with sluggish or deficient ovarian secretion reaches puberty. Compensatory stress is thrown on the suprarenals, pituitary, or thyroid glands, depending upon which of these glands dominate the physiology of this particular patient. Let us say that it is the suprarenal; then it makes an attempt to supply this ovarian deficiency. Should it not succeed in this completely, there is no inhibitory action of these glands (sympathetic) upon either the thyroid or pituitary, and a hypersecretion from the latter results. We now get what is termed a vagotonia. When one keeps in mind the organs supplied by the vagus, it is a

simple matter to see the clinical picture which follows. For instance, the effect on the stomach would lead to nausea and vomiting; on the intestines to diarrhea; and on the heart palpitation. The vagotonia would eventually stimulate the sympathetic; and uterine colic or cramps would undoubtedly occur. Should the pituitary attempt to right the endocrine disorder we would have added to the above picture those of intracranial pressure which is the result of transient swelling of the pituitary due to its increased activity, and a headache would evolve. This headache is usually supraorbital, or on the top of the head. Visual disturbances would be the result of pituitarial pressure.

This vagotonic state is practically always responsible for the pain and psychic disturbances found in dysmenorrhea ascertainable to an endocrine disturbance, and is due either to a compensatory exhaustion of the suprarenals or ovaries. It may also be due to a hyposecretion of one or both of the thyroid or pituitary glands.

We have said therefore that the gland that dominates the individual's physiology is the compensatory reaction. In mixed types, the gland that is predominant is the one that responds first. To determine the pre-

dominating gland we look for the distressing symptoms one would expect to see in the respective glandular hypersecretion. The thyroid type is the highly neurotic and emotional type of woman. The adrenal type is the energetic, highly aggressive, dominating woman. She has a marked overgrowth of hair. The pituitary type is the broad-shouldered woman with coarse features. She may also be stout, drowsy, lethargic and dull. The Ovarian type is tall, slender, and artistic.

When a patient shows an enlargement of the thyroid with slight signs of hyperthyroidism at puberty or with each menstrual cycle, and having dysmenorrhea, one must decide whether it is a physiological or pathological hypertrophy. If physiological it is due to either ovarian exhaustion or deficient ovarian development. A careful history will settle this question. Where there is profuse and prolonged bleeding at the menstrual period with dysmenorrhea one is inclined to favor the pathological hypertrophy. If in the early stage of the enlargement there is scanty menstruation, or long delayed period with dysmenorrhea, the enlargement is then due to the effort of the thyroid to augment insufficient ovarian secretion and is, therefore, physiological.

In dysmenorrhea seen with hypothyroidism and hypo-

pituitarism the clinical picture is essentially the same. These go hand in hand, for a deficient pituitary secretion deprives the thyroid of its functional impulses and hence the thyroid becomes deficient. This deficiency produces a hyperfunctioning of the ovaries and adrenals. Where we have hyperactivity of the ovary a sympathectonia results. We really have an increase in amount of Corpus Luteum (or its derivative--Progestin). An increased amount in one or the other or both of these hormones, gives more pronounced effects than a normal amount. Normally they stimulate decidual growth. If an increased amount of Progestin is present we get a precocious development of the decidua. As a result of this massive decidual development, and if conception fails, we then have a wholesale, as it were, disintegration of the hyperplasia menstrual decidua. Whereas, with a normal amount of Corpus Luteum we have a gradual necrosis of decidua. As a result of this immediate and extensive decidual degeneration we have given off in the menstrual lochia, solid tissue visible to the naked eye which is not seen in normal lochia. In comparatively mild cases the small fragments are called "flakes" whereas in the severer types we have irregular pieces of tissue which we call "plaques". This is referred to by many authors (2,3,4,5,7,9,17,18,20)

as "membranous dysmenorrhea". The amount of pain experienced with the passage of these "clots" is proportional to their size. There is also a greater amount of flow in these cases due to the greater amount of denudation of tissues with increased vascularity. The cause of the pain would be due either to actual separation of menstrual decidua or the expulsion of the products of the menstrual abortion from the uterus.

However, when one considers that the acme of menstrual pain is about two hours after the first appearance of the menstrual lochia, that the solid tissue resulting from "decidual necrosis" is not present in the vagina until second or third day of function, that cervical dilation does not always cure the menstrual pain, that a cervical stenosis cannot always be demonstrated when the menstrual pain is at its height, and that the cervical anomalies exist without causing the patient any menstrual discomfort he wonders whether the passage of these "clots" described above, can be said to produce the pain witnessed in dysmenorrhea. It seems doubtful that it does. Therefore, with the above in mind, it seems probably that the essential factor in production of the pain appears to be associated with the actual separation of the decidual tissue. The tissue then acts as a for-

eign body and induces severe and irregular uterine contractions which, in some cases, according to the pain, appear to be almost tetanic in character. It is believed that uterine anomalies do enhance difficulties but are not responsible, as a primary factor, for the menstrual pain. Whitehouse (7) and Bell (9) have demonstrated the above fragments to be present in such menstrual flow.

This above shows the effect of excessive ovarian secretion. As a result a sympathectonia is produced. However, these glands tire easily, and in some cases there is an excess of thyroid and pituitary secretion producing a secondary vagotonia. This often accounts for the diarrhea frequently seen during dysmenorrhea, also the nausea and vomiting. Where the dysmenorrhea is due to deficient thyroid secretion we find puberty is delayed and development of secondary sex characteristics altered. We often get scanty menstruation and often secondary amenorrhea. We frequently get mastodynia, increase in weight, and an increased fondness for sweets. Fatigue, coldness and deficient eyebrows also are present. The skin is coarse, dry and rough. In pituitary deficiency we get scanty periods, amenorrhea, a possible increase in weight, and the skin on the other hand is fine and smooth. The pulse is slow, blood pressure less and mental attitude is sluggish.

An outline of the various factors that produce endocrine abnormalities would not be out of place:

1. Following childhood diseases.
2. Following severe chilling.
3. Chronic debilitating diseases.
4. Physical or mental shock including major operations.
5. Prolonged lactation.
6. Too frequent pregnancies.
7. Too much overwork.
8. Cardiac lesions.
9. Lead poisoning, morphine poisoning, etc.
10. Too much strain, depression, etc. (5)

The endocrine theory as a causation of dysmenorrhea is very plausible as has been shown by the various cases reported in literature. The various men have cured such cases with endocrine therapy.

VI. Faulty Body Mechanics and Poor Muscle Tone:

It is conceded that the tone of the skeletal muscles serves as a good index to tone of the circulatory system, and consequently individuals with poor skeletal muscle tone may be said to have a poor tone in their circulatory system. The significance of this becomes evident when it is recalled that the pelvic organs are abundantly supplied

with blood vessels; the veins forming an interlacing network through anastomoses between pampiniform, uterine, cervical, vaginal, bladder, and hemorrhoidal plexuses. These veins are thin-walled and except for those of the uterus receive their support from intra-abdominal pressure. They are also distinctive in that they, and the large veins into which they empty, do not have valves as do the veins of the legs. In the quadruped these points are of little significance, while in the biped or human being, they may be important in the explanation of certain pelvic symptoms. Roughly, the total blood volume of the body may be divided into quarters. One quarter being the peripheral circulation, one quarter being in the heart and lungs, and the remaining half in the portal circulation and other abdominal organs. In the quadruped most of the blood volume is near the heart level and consequently no excessive strain is placed on the vascular system. In the biped, or human being, most of the blood is below the heart level and the circulatory system is subjected to considerable strain. So long as the muscular tone of the body is good no untoward effects are noticed; but with the loss of tone, distressing symptoms may arise. Because of their location in the most dependent portion of the peritoneal cavity, and because of the presence of numerous interlacing valveless veins,

the generative organs are particularly susceptible to conditions causing congestion. No doubt the presence of varicose veins in human beings and the scarcity of such in quadruped is a clinical manifestation of this relation. (Fig. 1 shows blood distribution in biped and quadruped) (1)

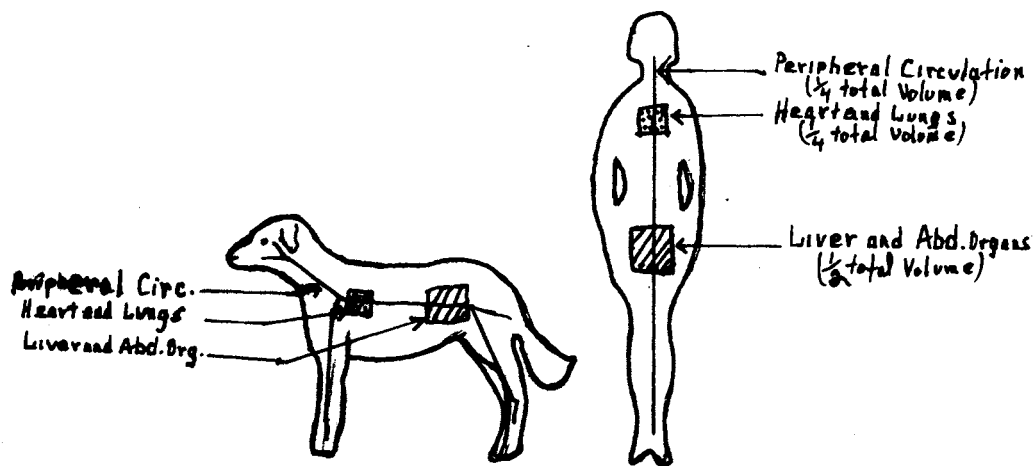


Fig. 1. Comparison of quadruped and biped, showing distribution of blood volume: one fourth in the peripheral circulation, one fourth in heart and lungs, and the remaining half in the portal circulation and abdominal and pelvic organs. (1)

The physiologic changes occurring at the time of normal menstruation must also be considered. The first or premenstrual stage lasts from seven to ten days and is characterized chiefly by congestion of the pelvic organs. When hyperemia of the uterine mucosa reaches

the breaking point, hemorrhage occurs into the surrounding tissues by rhexis and diapedesis. This inaugurates the second or desquamative stage, characterized by loss of surface epithelium from the uterine cavity and the onset of menstrual flow. Normally this stage is thought to last about four or six days, following which is the third stage or regenerative stage. This consists in rebuilding the endometrial glands and usually takes about four or six days. The next stage is the resting stage and lasts from ten to fourteen days. (Refer to Table I (1)).

Premenstrual or Congestive Stage	Menstrual or Desquamative Stage.	Regenerative Stage.	Resting or Post-menstrual Stage.
8-10 days.	2-4 days.	3-7 days.	8-10 days.
Glandular hypertrophy. Hyperplasia of endometrium. Congestion. Hyperaemia.	Desquamative phase. Loss of surface Epithelium.	Regeneration Rebuilding and reconstruction of glands.	Resting or Quiescent Period. Little Change

Table I. Relation between pain, congestion and stages of the menstrual cycle. (1)

If lack of muscle tone plays a part in causing dysmenorrhea, one might expect the discomfort to begin before or with the onset of menstrual flow and cease as soon as the congestion subsides and pelvic organs depleted. In the majority of cases this is what happens. This is shown in a study of 1000 cases of painful menstruation by Dr. N. F. Miller.(Fig 2. (1)).

Day pain lets up	Cases	Percent
1st. day-----	500-----	50
2nd. day-----	295-----	30
3rd. day-----	135-----	13
4th. day-----	46-----	5
5th. day-----	18-----	2
6th. day-----	6-----	0

Fig 2. Duration of pain in dysmenorrhea as determined by study of one thousand painful periods. (1)

Apparently the superimposing of the physiologic congestion of menstruation on the already congested pelvic organs is more than the structures can comfortably tolerate and the dull steady pain characteristic of congestion is the result.

Those who favor neuroses as a causation of dysmenorrhea must explain the paradoxical improvement under conditions favoring increase in neurotic tendencies--irregular work and hours, study, etc. The situation, however,

permits a satisfactory explanation on the basis of faulty muscle tone, for it is well known that high strung or nervous individuals have better tone than do the phlegmatic type.

Additional evidence favoring the muscle tone theory is to be found in the studies of parous women, in whom the average posture and muscle tone is generally low. In a review of 200 multipara without evidence of infection, all of whom had ~~two~~ or more children, Miller (6) found that 44 per cent had dysmenorrhea. In most of these it was the congestive type, the pain beginning before or with the flow and disappearing within the first day after the onset. Since primary dysmenorrhea may be excluded in parous women, it appears that the incidence of secondary types is actually higher than among the young women forming the basis of this study, where the primary type could not be eliminated.

It seems, therefore, that posture and muscle tone do have a relationship with dysmenorrhea from the congestion angle. This argument deducts materially from the psychogenic theory since neurotic conditions were increased, but when poor body posture was corrected the dysmenorrhea was reduced. Consequently the poor body posture and muscle tone theory as cause of dysmenorrhea is highly appreciated.

The data on the above theory was obtained by Miller (1), from a study of the girls entering classes at Wellesley College, the University of Iowa, and Nurses Training School at the University of Iowa. In all 785 young women were studied. Each girl was subjected to the usual physical examination required for admission and in addition was qualitatively classified as to posture and muscle tone. Anterior and lateral aspects of each subject were obtained. Each individual and shadow picture was studied by well-qualified persons on a postural basis. Each girl in addition was questioned as to the absence or presence of menstrual pain, and in addition all dysmenorrhea classified into groups, depending on the severity of symptoms.

7. Roentenescopy:

Little mention is made in literature of the dangers of prolonged exposure of the female organs during fluoroscopic examinations, and no mention is made of menstrual disorders that result from these procedures. During the past five years Weiss (8) has run across a number of his patients whose menstruation was disturbed after having gone complete G. I. examination which included roentgenography and roentgenoscopy. All of these patients have a history of having been well up until the time of the X-ray examination.

Several of the patients had menstruated normally and regularly up to this time, and for a few months up to a year following this examination amenorrhea developed. However, menstruation eventually returned. Several of the patients showed appearance of dysmenorrhea. They all emphasized the fact that their periods were painless before these X-ray examinations, but since then, painful menstruation was present. As in amenorrhea, normal painless menstruation finally returned.

Idiosyncrasy may be an important factor etiologically, but it is more probable that there was some glandular dysfunction. This may be borne out by the fact that several patients suffering from dysmenorrhea before the X-ray examinations were free of painful menstruation following these exposures. In this it may be that glandular dysfunction was righted by inhibition of certain glands. However, this etiological factor is without accurate data and further observation in this field is necessary before any definite conclusions can be reached.

8. Allergy:

Allergic phenomenon as an etiological factor in dysmenorrhea is becoming more popular in modern medicine. Previously little stress was placed on this phenomenon which is shown by the scanty references in relation of allergy to

dysmenorrhea. The allergic substances are thought to enter the body and produce a neuralgic type of dysmenorrhea. This is to be distinguished from the congestive type described by Miller. (1) The latter producing dull pains while the former producing severe cramp-like pains. Schraeder (12) thinks it is due to excessive irritation of the vegetative nervous system by toxic substances that menstruation evokes into the blood.

Duke has briefly mentioned the relation of allergy to dysmenorrhea. He states that he has observed patients with a general reaction suffer from dysmenorrhea attacks. He also states that most of these symptoms disappeared after appropriate treatment. In one food-sensitive case he noted that the menstrual flow was accompanied by severe pains and had even occurred twice in a month for years, which became completely normal in four week intervals upon avoidance of foods to which the patient reacted.

Cooke records dysmenorrhea in two women 26 and 38 years respectively. In both of these cases he states that the symptoms were part of an immediate reaction with asthma, coryza, and urticaria, and did not show up for three hours or more.

Smith (12) was very much impressed by Cooke's and Duke's results, and carried on the experiment with the above

facts in mind. He reports using 12 women having dysmenorrhea. They all were nulliparous and the age range was between 18 to 34 years. They were under observation from three to eighteen months. The dysmenorrhea complained of had existed for many years; in some since the onset of menstruation. Some were students, stenographers, housewives and two were unemployed.

Skin tests for commoner foods were made by scratch method and were read in 30 minutes. They consisted of small elevated surfaces with little or no erythema. The substance that gave positive reactions were omitted from the diet beginning one week before the expected date of menstruation. These foods being wheat, eggs, milk, beef, chocolate, nuts, beans, peppers, cauliflowers, cabbage, and fish, in the order mentioned. The reaction was visible in six hours and usually lasted for about twelve hours. Of the 12 cases studied, eight stated they were free of all menstrual pain and could go about their business as usual. Four had received only partial relief although they were able to continue their work as usual, if they took acetyl salicylic acid, ect, for part of the day. For this group, Smith felt that his tests were not thorough enough. Tests should be made for inhalant and many other substances that are undoubt-

edly responsible for allergic manifestations.

It would seem therefore from the above reports and results obtained in his twelve cases that there is a definite relationship between dysmenorrhea and allergy. Consequently it is important to consider allergy in treatment of cases. Before any conclusions can be made, more work must be done in this field.

9. Uterine Polyps:

Uterine Polyps produce dysmenorrhea probably on the basis that they produce undue pressure on the nerve filaments of the uterus and give cramp-like pains. (4,7,18,19)

10. Myomata:

Myomata of the uterus frequently cause "menstrual cramps". The pain is seen more in diffuse adenomyomata of the uterus than with discrete fibromyomata. Nelson (19) does not believe that dysmenorrhea is caused by intramural myomata whereas Crossen (18) and Graves (4) believe that it is. Nelson believes that a pedunculated submucous myoma is the source of much pain because the uterus attempts to expel this tumor mass which acts as a foreign body and as a result severe paroxysmal uterine cramps occur. The pain is usually due to incarceration of the tumor mass with pressure on adjacent viscera and fixed structures. Adhesions often produce severe pulling

and dragging pains.

11. Less Common Causes:

- a. Divided states of the uterus due to imperfect fusion of the Mullerian ducts.
- b. Atresia of the cervix of vagina.
- c. Accessory occlude uterine cavities.

These are not common and can be dismissed with the statement that dysmenorrhea in these conditions is of intrinsic origin. (10)

12. Endometriosis:

Endometriosis also produces dysmenorrhea--probably as the result of irritation of nerves in the uterine mucosa.

13. Tubal Infection:

Ovarion tumors are also etiological factors in dysmenorrhea.

TREATMENT

TREATMENT

Dysmenorrhea is perhaps as common as any condition which the gynecologist is called upon to treat, and certainly as baffling. This is obvious particularly because this affection is commonly relegated to the category of "minor gynecological disorders". As yet we know very little of the primary causes, which have been attributed to infectious diseases, bad hygiene in early life, poor muscle tone, psychic, anemias, and malfunction of the glands of internal secretion, particularly the thyroid. However within the last few years intensive study of the physiology of the female reproductive system has given us new hope of solving the problem. Regardless of all encouragement given us, the percentage of failures reported from every method of treatment is disheartening, and the variety of treatments advocated is eloquent testimony to the fact that none is uniformly successful, and that the specific remedy is yet to be found.

Men who have investigated the subject report that dysmenorrhea is increasing everywhere, with the continued progress of civilization and of the added complexities and

and refinements of life. Since 75 per cent (23) of our American women suffer from this condition the importance of this subject can hardly be over estimated. Therefore, the relief of dysmenorrhea is urgent from both economic and physical viewpoint. Until we come to realize that each case is a separate problem, within itself and must be worked out as a separate and distinct proposition, throwing empiricism to the winds, we shall continue to make little progress in the treatment of dysmenorrhea. By knowing the etiology in every case, treatment can be justifiably instituted.

The most effective cure, according to our noted gynecologists, is a full term pregnancy. This process can be prescribed to married women, but in the young unmarried woman, unfortunately, marriage cannot be prescribed as complacently as can medicine.

Two problems confront the physician when he is called upon to treat a case of dysmenorrhea; (a) to give immediate relief of the present attack of pain, and (b) to seek permanent relief--determination of the latter can wait.

Measures for Immediate Relief.--

During the actual period of pain relief must be given by measures which are frankly palliative and which cannot

be expected to exert any permanent effect upon the disease. Rest in bed is necessary in severe cases, and is usually resorted to by the patient on her own initiative. Hot applications, either by the electric pad or the hot-water bottle, are always acceptable. Although a paradox, yet an ice bag applied over the sacrum sometimes gives almost immediate relief (Bland). Hot baths and warm enemas, taken just at the beginning of the flow, are frequently helpful. Hot, stimulating drinks usually give slight, temporary relief, but alcohol should never be employed as a routine measure. The inexpediency of alcohol is self obvious. Relief by medical measures must be invoked in all but the mildest cases. The coal tar derivatives are generally effective, but they should be employed cautiously; treatment should be begun tentatively, with small doses of less potent drugs, and the stronger drugs in larger doses should be resorted to only as the need for them arises--a mode of therapy that is obviously wise in a condition which is recurrent and periodic rather than ephemeral and short lived. Benzyl benzoate, in doses of 1 to 2 drachms, has been reported to give extremely good results, and is best given in the form of gelatine globules, as the taste is nauseating. Codeine, in $\frac{1}{4}$ to $\frac{1}{2}$ grain doses, must be resorted

to when aspirin, pyramidon and similar agents bring no relief, and must be administered by hypodermic. Nausea and vomiting are a part of the syndrome. Morphine is necessary in the occasional case, but it should be employed reluctantly, and every effort should be made to limit its use. Kelly suggests the rectal administration of bromide of potash or bromide of sodium, 30 to 50 grains to the pint of hot water, but the patient with dysmenorrhea of any marked degree is rarely benefited by this measure beyond the temporary relief obtained from the introduction of the hot solution.

From what has been said as to the causative role of exaggerated and painful muscle contraction, the administration of antispasmodic drugs would seem to be called. Novak (23) advises the use of atrophine sulphate, as do others. He administers atropine in doses of 1/100 grain or tincture of belladonna in doses of 10 minims, three times a day, for two or three days before the period and for the first day or two of it. The tolerance of the individual patient differs, but in every case the medication should be discontinued as soon as dryness of the throat, flushing of the cheeks, mild disturbances of vision and other signs of intolerance are noted. Drenkbaber recommends the injection of

atropine directly into the cervical canal or the tamponade of the vagina with cotton-soaked in a solution of the drug, but such a method is obviously undesirable in any case, and is impossible in young girls. Lately a more rational and perhaps more effective antispasmodic may now be available. The biologic inhibitors of uterine contractility, on the basis of laboratory investigation, are progesterin and the lutenizing principle in the urine of pregnant women--prolan. The latter is now available for human use, but the former has not been accepted because of lack of experimental data regarding its accurate action and also because of that fact that it is so expensive. Novak (23) suggests the intramuscular injection of 100 units of Antuitrin-s (Parke, Davis & Co.), one or two days before menstruation, this being repeated one or two days, depending on the severity of the pain.

The procedures above are mainly employed in the immediate relief of dysmenorrhic attacks. The measures necessary to secure permanent relief will be discussed next.

Measures of Seeking for Permanent Relief.--

General Measures:

The general treatment of dysmenorrhoea is not based

upon the application of remedies during the period, but rather upon correct hygiene throughout the month and particularly throughout the period. These measures should be invoked in all patients suffering from dysmenorrhea, and particularly in young girls, for in many instances it is not necessary to seek farther for the cause than bad hygiene, lack of sleep, too much dancing, too much excitement in the unwholesome atmosphere so characteristic, as has been said, of the days and nights of modern young woman. Also the instances in which mental development has been encouraged at the expense of physical development; it is advisable to allow the girls to give up attending school for a year or so, and to spend the time in the country, as far outdoors as possible. Most of the patients suffering with dysmenorrhea are thin, emaciated, poorly developed individuals with weak abdominal muscles, absent abdominal breathing and faulty body posture. Naturally the uterine musculature is feeble and exhausts easily. An exhausted muscle forced to continue contractions gives rise to cramps and colicky pains consequently instituting proper hygienic measure and exercises will benefit them very much. Constipation necessarily is a bad influence, as a mass of feces may act very much like a pelvic tumor and increase congestion. Therefore careful regulation of the bowels is essential and is particularly

important during the week before the period, when pelvic congestion is increasing daily. Errors in diet should be corrected, and the tendency to restrict the intake of nourishing food for the sake of the slim figure which is so general at the present, should be severely frowned upon. A good method to remedy most of these conditions is as follows:

A. Establish correct mental attitude.--

The correct mental attitude toward dysmenorrhea is essential. The patient who anticipates a trying experience, probably from maternal teachings, and prepares for it in advance by the disruption of her entire routine of life during her period, who goes to bed with hot applications and anodynes even before the pain appears, usually gets just what she expects. However, if she does have such pain she should wait until the actual need for them arises before she institutes them. When the physician sees the patient at this stage he should avoid haste and be sympathetic with her and explain the whole situation to her. She must be made to understand that menstruation is a natural function and should be free of pain and internal discomfort as are the other functions of the body; that in the majority of women that is the case; and that, since her organs are healthy, there is no reason why she should not

overcome her disability during the period. The normal routine of life should not be interrupted. She must also realize that she is not ill and that baths and exercise during her periods will not harm her in any way, and quite to the contrary, they will benefit her. She will leave the office very much improved and with a more receptive mind of the normality of such conditions.

B. Correct Clothing.--

The patient should be instructed to avoid wearing garments that are constricting in nature at the waist as this is likely to impede the pelvic circulation. Today this point is difficult to drive home since the modern girl is desirous of a slim figure.

C. Correction of Constipation.--

Plenty of water should be drunk and fruit eaten. Over-eating is bad, but enough food should be taken to give bulk to intestinal content; exercise in the fresh air, abdominal kneading at night and morning, and a regular attempt to empty the bowels at the same time every morning should be insisted on. Purgatives should be used temporarily.

D. Exercise.--

Exercise should be taken systematically and regul-

arly. The objection being to increase the tone of the musculature of the abdominal wall, bowels, and uterus, and to improve the general and local circulation, and so to produce improved nutrition and muscular development. Clow (24) states that "only those who are in good general health and in whom there is no evidence of appendicitis or of pathological conditions of the genital organs should take exercise." In these there should be no reduction in the amount of exercise.

It is advisable to select only a few movements especially effective for dysmenorrhea, and have them printed on a sheet and give them to the patient. Tell them to do these exercises for a quarter of an hour daily for a few days before the onset of the period and on no account to fail to do them on the first and second days of the period. They should be done with enough vigor to promote a sensation of heat or a gentle sweat. Clow states that only a few have failed to get relief and that usually even though the pain has already begun exercise usually dispells it. After continuing the treatment for six to twelve months, many are able to leave them off altogether, provided they are not engaged in sedentary occupations.

Clow and Philips (24, 37) suggest the following routine:

- (a) Floor polishing--kneel on all fours. Swing arms through a semicircle, reaching as far back as possible. Repeat swing ten times with each arm.
- (b) Bending--stand with feet apart. Stretch arms above the head, bend forward and touch floor and then return to first position. Repeat slowly 8 times.
- (c) Twisting--with arms straight out twist from one side to the other, and bring arms as far back as possible each time. Repeat vigorously 10 times.
- (d) Swaying--stand with feet apart. Stretch arms above head. Sway body and ~~arms~~^{arms} to right, then left. Repeat slowly 10 times.
- (e) Rowing--sit on the floor with knees straight and feet pressed against wall. Lean forward and touch wall with knuckles. Come back to sitting position. Repeat rythmically 20 times.
- (f) Right to left and left to right--stand with feet apart. Swing right arm up far as possible. Bend down, bringing right arm over and touch left foot. Repeat 6 times. Do the same with left arm and right foot. Repeat 6 times.

- (g) Floor patting--kneel, sitting back on heels. Twist body and tap floor with both hands four times on left side. Kneel upright. Then repeat on right side. Repeat 8 times on each side.
- (h) Bean picking--throw 20 small objects, such as beans on floor, unless household routine provides substitute, and pick one up at a time and place on shelf above the head. Alternate hands. Do as quickly as possible.

In addition to the above purpose these exercises would also serve as an aid in the regulation of the bowel action.

E. Baths.--

Most patients are still under the impression that it is unsafe to take a bath during the period, so they are told, but in spite of old prejudices, baths are not only harmless, but beneficial. The complete daily wash is necessary hygienic measure, but immersion in a warm bath at night is not only salutary, but checks or helps to prevent the onset of aching and discomfort. There is no harm in the continuation of the cold morning bath or cold sponge during the period. For women subject to severe dysmenorrhea, who are nervous or otherwise unfit for muscular exertion, immersion of the whole body in a hot bath (100°F) for ten to fifteen min-

utes just as the period begins is a good prophylactic against pain, and will often relieve a patient already in pain. Its effect, being quicker, is more striking than that of exercise, but it has relative disadvantages, in that it must be followed by rest in bed for at least an hour, and, unless the patient can keep thoroughly warm afterwards, preferably by muscular effort, the pain is apt to return.

Clow (24) favors the above type of bath but condemns the Sitz-bath as a cure for dysmenorrhea, in that the latter is only a chilling performance. She also says that the hot-water bottle is merely a counter-irritant, and abdomens are sometimes scarred by its uses in cases of extreme pain. She states that of the 2,300 girls that she has come in contact with among school girls and college students who were doing routine exercises and playing various games, only six reported that the games at the period did not suit them or relieve them in any way; and that not in one case out of the whole number did she hear of or note any ill effects at the time or subsequently. During her practice she has had over 400 cases of dysmenorrhea and of this number only 14 did not receive any relief. Three of these later secured complete cure after

continuing the exercises prescribed them, for a period of 6 months to 9 months.

A change of occupation or environment frequently produces good effects. Clow (24) and Philips (37) reports cases where women teachers, typists, private secretaries, and others whose work is more or less confining and sedentary, showed marked relief of their symptoms when their physical and occupational surroundings were changed.

With the above facts brought out it is evident that too much emphasis cannot be placed on general hygiene, proper exercise, in open air, correct mental attitude, proper food and attention to impoverished states, proper elimination, baths, and other hygienic measures.

Medical Measures i. e., Drugs.--

When one considers the role of the medical treatment of dysmenorrhea he is confronted with a situation not easy to handle, for he knows that drugs therapy as practiced today, in nearly every case, is only palliative and requires repetition at each painful period. Philips (37) goes so far as to say that "all drugs used today in the treatment of dysmenorrhea are only palliative in nature". As one reads the vast amount of literature written on medical treatment he comes to the conclusion that this

palliative treatment is necessary until general hygienic measures can be instituted to produce permanent results.

Diasio (22) recommends strict medical treatment as being more beneficial than surgical treatment while Graves (4) advocates the latter. A combination of the two perhaps would be wise.

The drugs to be mentioned were obtained from a review of all literature written during the last 10 years.

Atropine sulphate is one of the oldest and most widely used drug we have. Novak (24) advises its administration orally in doses sufficient to cause mild saturation symptoms. He says an average dose is 1/120 grain every four hours, beginning from a day to several days before the period, depending on the usual time of onset of the pains and as to its severity. In the case where headache is so prevalent Novak advises the use of Acetyl Salicylic Acid grains 5 in conjunction with the atropine. Ezell (35), Rothrock (38), Graves (4) and Crossen (18) administer atropine similarly to Novak. Drenkhaber also advises oral administration of atropine, but he maintains that he has more success when atropine is injected directly into the cervical canal. He uses 1 mg. in one cubic centimeter of water. Drenkhaber begins his injections two or three days before menstruation is expected and does

it three times a day.

Benzyl-benzoate, another antispasmodic, is highly recommended by Litzenberg. It is often used in association with ovarian residue, the latter being given in 5 grain doses three times a day for ten days preceding the period. Two teaspoonfuls of 20% emulsion of benzyl-benzoate are given three times a day at the onset of the pain and the ovarian residue is discontinued. Litzenberg and Stacey report over 60 per cent relief with this regime. Ezell (35) finds benzyl-benzoate very beneficial. The bad feature here, is that it is only a palliative and not a curative procedure. Diasio (22) reports very little success with use of benzyl-benzoate.

Diasio (22) recommends very highly the use of Viburnum. He has it made up in a tablet form along with other components as follows:

☞ Gentian	1.25 grains
Viburnum prunifolium	2.50 "
Viburnum opulus	2.50 "
Monosodiumbenzylsuccinate	2.00 "

Gentian is a familiar bitter and stomachic, and as practically every case of dysmenorrhea is complicated by constipation and stomach trouble, the inclusion of gentian is justified. (22) Salines can be used where the consti-

pation is stubborn.

Viburnum is a comparatively recent addition to pharmacy. It was mentioned first in materia medica in 1892 by Whittla. Shennan contends that viburnum undoubtedly has an influence on the motor side of the spinal cord. Rugby, Bliss, and Ballard agree that "viburnum exerts its antispasmodic action on the unstriated muscle of the uterus. It relieves pain as well as checks spasmodic action and is used in dysmenorrhea as a uterine sedative."⁽²²⁾

(22) Crossen (18) has reported success in the use of viburnum prunifolium for dysmenorrhea. It must be conceded, therefore, that viburnum is an antispasmodic and analgesic, with a selective uterine action. Laboratory experiments on animals have proved that viburnum prunifolium and viburnum opulus exerts a specific action on the uterus. The fourth ingredient represents an interesting product. The sedative qualities of the benzyl esters are known and the succinate ester is the more active and has a less pungent taste.

Diasio (22) reports gratifying results in 63 cases of dysmenorrhea treated with this viburnum compound. There were no cases of retroversio uteri, cervical stenosis, malformation of genital organs or other obstructive condi-

tions to the passage of the catamenial flow. His second series gave better results and were the type of cases with which the general practitioner would be called upon to treat.

He treats his patients as follows. "The patient is to take 2 tablets prior to onset of menstrual flow, and 2 tablets every four hours during the period. As mentioned before, steps must be taken to have good bowel elimination. Rest in bed is not essential. In fact, many observers show that exercise will actually assist in the relief of dysmenorrhea. However, if the patient does not cherish the exercise let her please herself in the matter of rest or exercise."

He has found in most of his patients that the pain ceased to recur in subsequent periods and that the condition appeared completely relieved. All this is due to the de-congestive and sedative qualities of *Tabella viburnum* Comp. In none of the cases under observation was there the least sign of unwanted reaction or any unpleasant symptoms whatever.

Spitzig recommends the use of sodium citrate, 20 grains three times a day, during the week preceding the period. This he says, reduced the viscosity of the uterine blood which has a more than normal blood vis-

cosity as a result of menstrual congestion.

Klein and Eliesz favor the use of adrenalin when the dysmenorrhea is due to hyper-ovarian secretion. This dysfunction produces edema of the uterine mucosa which results in uterine colic, and since adrenalin is said to be an antagonist of ovarian secretion it is called for to right this condition. It is given hypodermically, ten minjums at the onset of menstrual pain or slightly before, if possible. Klein reports that of 35 cases of dysmenorrhea treated as such, only two failed to be relieved completely.

Cocaine 5%-20%, applied to the genital spots in the nose often is beneficial. Ezell (35) and Nelson (19, 20) reports moderate success with this therapy. Brettauer and Mayer have given up the use of cocaine for trichloroacetic acid because the latter gives more lasting results. They make four applications of trichloroacetic acid between periods and if beneficial results follow, to repeat at the next intremenstrual cycle. They report relief in 50%-75% of their cases. However, Graves (4) has found this method very disappointing in nearly all his cases. Both the cocaine or trichloroacetic acid are applied to the so-called genital spots with cotton pledgets.

The use of ammonol, 5 to 10 grains three times a day for two days preceding menstruation recommended by Clow (24) was used extensively in England, but with little success. She states that it should be used for about a year but most patients desire more instant relief or cure and consequently it is discarded by them after two or three months.

Hertzler (17) has shown that when thyroid disease is present dysmenorrhea is usually associated with it. In such cases a chronic hyperthyroidism is present and to overcome this hypofunction of the gland iodides are deemed necessary to whip this gland into functioning properly. These are given along with sedatives to minimize stimulation of the nervous system. Sodium bromide and fluidextract of hyocyamus are good. Bromidism is prevented by the addition of the small amounts of Fowler's solution. Cascara takes care of the constipation, if present. If the iodides prove too stimulating, milder stimulants such as, thyroid extract or syrup of iron iodide appears or stomach is upset, luminal substituted temporarily for the bromide and hyocyamus. It is best to stay with the iodides as long as possible. Wendel (26) also advises the use of iodides. Hertzler (17) and Wendel (26) have standardized the following prescription for dysmenorrhea associated with thyroid

disease:

Potassium iodidii	8	3 ii 3 iii 3 iii 3 j m 3 VIII
Eldext. hyocyami	12	
Liquor potassi arsenitis	12	
Sodii Bromidi	48	
Rubelixir q.s a.d.	240	

Met-Sig: Take one teaspoonful in water three times a day, before meals.

They say that "this medication is to be continued indefinitely until there is admitted improvement. It should be remembered it takes from 6 to 18 months to effect a cure. The pulse should be taken daily and if it gets below 70 or 80 the dosage should be cut down, but not discontinued. Usually the small goitre will disappear and finally the dysmenorrhoea." Hertzler and Wendel report very good success with such a procedure.

Philips (37) often uses Potassium bromide grains ten and Sodium salicylate grains ten, three times a day before the period, with luminal grain $\frac{1}{2}$ during the pain, repeated judiciously up to the point of drowsiness as a palliative measure only. He does not boast any cures--just relief.

Gurber and Hirz have been quite successful with the use of uzara. It is advised in cases where there is uterine atony.

Other drugs used are acetanilid, pulsatilla, hydrastis, dionin, antipyrin, salocodin, and a host of others--none be-

ing efficient enough to sanction continued usage.

Glandular Therapy.--

Of prime importance in the treatment of dysmenorrhea due to endocrine disturbance is accurate diagnosis. First to be certain there are no gross pelvic pathology underlying it, and second, to determine which gland or glands are responsible for the disturbance. Also whether there is a hypo-secretion, hyper-secretion, or dysfunction of one or several.

One must keep in mind the various organic extracts that are marked as so many grains of either the fresh gland or so many grains of the dessicated gland. This makes a marked difference as one grain of the dessicated gland is equivalent to five grains of the fresh gland. Then too, there is a difference of opinion as to whether one should use whole gland of the ovary or only parts such as corpus luteum or the residue, and the same applies to the pituitary, that is, the anterior or posterior lobe or the whole gland.

When there is an ovarian deficiency, ovarian extract (dessicated) in five grain doses three times a day for a period of two or three months is advisable. As will be recalled, ovarian deficiency is characterized by lower blood pressure, torsion of the teeth and absent lateral

incisors or canines, atrophic areas or white spots on the finger nails, and abnormally large hips and lower extremities, disproportionately greater in circumference than arms and thorax. (35)

Ovarian whole gland substance is also indicated when hyperpituitarism exists. In hyperpituitarism there is produced vagal stimulation, heightened blood pressure, and intra-cranial pressure symptoms, e.g., pituitary headache, visual disturbances from pressure on the optic nerves, nausea and vomiting and finally dysmenorrhea. The cranial pressure arises from the transient swelling of the pituitary gland because of its increased activity. The same dosage advocated above is to be administered. This procedure relieves the above syndrome in most cases. The reason for this procedure is that the pituitary is synergistic with the ovary and the administration of one relieves the stress on the other.

Occasionally hyperthyroidism accompanies ovarian deficiency. When definitely provedⁿ, Hertzler(17), Wendel (26), Crossen (18), Bercovitch (3) and Ezell (35) advise the administration of thyroid extract $\frac{1}{2}$ grain three times a day in association with the ovarian therapy. This will allow the thyroid gland to return to

normal.

The administration of Theelin is not given with the purpose of aiding deficient functioning ovaries, but to stimulate the development of a hypoplastic uterus. This has been proved in animals by Novak (23). He advises the hypodermic use of Theelin (folliculin) where we have a hypoplastic uterus. He administers 1 c.c. (50 cat units) on alternate days for 6 days beginning just after menstruation. It is therefore, given during the follicular phase of the cycle. Novak (23) says "that Theelin should not be administered in dysmenorrhea unless the uterus is hypoplastic as it is an active antispasmodic." Consequently accurate diagnosis is designated before therapy is instituted.

Another presumable ovarian substance used in the treatment of dysmenorrhea is Progynon, an Allen-Doisy female sex hormone. It is derived from placental tissue. Many question its being ovarian in origin. Hacker (32) reports good results in treating a severe case of dysmenorrhea with it and the results are encouraging. He first gives 500 units of Progynon ten days before menstruation. If no relief is obtained he then gives 1000 units ten days before the period. Sometimes the

nose is cocaineized three days before menstruation. Luminal every three hours is often beneficial. This patient received this therapy for four months and has been completely free from symptoms for the last year.

Hyperthyroidism usually occurs if the ovarian deficiency has been pronounced or if the pituitary gland is sluggish. This is the result of ultimate compensatory action of the thyroid. To determine this is an easy matter as the symptoms of hyperthyroidism are familiar to us all. When this exhaustion occurs, the administration of $\frac{1}{2}$ grain of thyroid extract three times a day is beneficial. To avoid further over activity on the thyroid, ovarian extract should be given. Ezell (35), Bercovitch (3), and Clow and Philips (37).

Hertzler (17) has shown that when thyroid disease (Chronic hyperthyroidism) is present dysmenorrhea is nearly always associated with it. In cases reported by him, he states that "simple thyroid treatment relieved the dysmenorrhea." He frequently administers thyroid extract in these cases of hypo functioning thyroids, but favors the use of Potassium Iodide as described previously.

Frequently pituitary exhaustion occurs in ovarian dysfunction. In such cases Bercovitch (3) and Novak (5)

recommend the administration of whole pituitary gland-- two grains three times a day. This is rarely necessary because spasm of the uterine musculature is already present and pituitary administration doesn't seem plausible.

Adrenal deficiency usually follows prolonged illness and is characterized by symptoms seen with weakness. These are inconsistent and consequently little attention is paid to adrenal dysfunction. When this dysfunction is accurately diagnosed adrenal extract in conjunction with strychnine is advocated. Cortin has not been of any value. Since the thyroid gland is often considered a synergist to the adrenals (35) thyroid extract in doses mentioned above often allows the exhausted adrenals a chance to return to normal.

Organotherapy has been extensively employed with both good and poor results reported. There is a great deal of criticism as to the efficiency of endocrine therapy on the grounds that it is all theoretical and as yet unproved. Exell (35) says that "up to the present time no other theory so satisfactorily explains the phenomena of dysmenorrhea or is so encouraging in the promise of a remedy for this distressing condition, and glandular therapy is at least as justifiable as the surgeon's exploratory operation."

Irradiation Therapy.--

The use of the X-ray in small doses has been suggested for the treatment of dysmenorrhea by Ford (27). He uses the short wave length rays. The time of exposure is comparatively short; 5 per cent of an erythema dose is applied at the depth of the ovary. In a series of 29 cases, relief of pain for varying periods of time was ~~reported~~^{reported} in 19. A repetition of the irradiation at intervals of three months is possible without adverse effect on the ovarian function.

The development of pregnancy in a few of his cases prevented a more accurate report. The initial irradiation was effectual in most cases.

Ford (27) says, "this is a method which must be employed with the greatest caution, but in view of the results obtained at Mayo Clinic it seems justifiable to recommend it in the occasional case of an intractable pain." The immediate effect is purely stimulative, but the persistence of the relief over months or even years suggest a more permanent action than the mere liberation of an excessive amount of ovarian hormone. The good results are possible due to the destruction of unhealthy or atretic follicles, or the abnormally persistent luteal bodies which inhibit normal cyclic function. (27)

He also irradiates the pituitary gland along with the ovary--alternating sites of irradiated.

Cassidy in the Royal City of Dublin Hospital reports 50 per cent cure in his cases treated with irradiation.

Werner (42) reports surprisingly good results from application of small roentgen doses (one field irradiation and $1\frac{1}{2}$ erythema dose) to the hypophysis as a mode of treating dysmenorrhea. He reports very little success with either drug or surgical therapy. He avers that the results tend to "wear off," but re-irradiation produces relief. Werner (42) states that "since this procedure is absolutely harmless, painless, and easy to apply, it is worth a trial."

Polak (29) advocates the use of radium in dysmenorrhea where no adnexal lesions are present. He dilates the cervix and 50 mg. of radium properly filtered, are introduced high in the uterine cavity and allowed to remain there for a period of four hours, a dosage of 200 mg. hours. He maintains that this amount of irradiation does not stop menstruation; but for some unexplained reason, relieves the pain at succeeding menstrual periods.

Polak has treated 36 cases of dysmenorrhea with absolute relief of pain in each. Philips (37) likewise re-

ports good results with radium therapy in dysmenorrhea.

Wendel (26) condemns irradiation as a therapeutical agent in dysmenorrhea on the grounds that the ovaries are often over-irradiated with a result~~and~~ climacteric that is worse than the original affliction.

In patients approaching the menopause who suffer from a dysmenorrhea of the disabling type, certain authorities recommend a sterilizing dose of X-ray. Such cases must be selected carefully, for dysmenorrhea is frequently associated with very marked nervous symptoms, which irradiation could not fail to aggravate, and the exaggeration of which would not justify the relief of the periodic pains. Hysterectomy sounds more plausible in such cases. This would then spare the healthy functioning ovaries.

Surgical Measure.--

No treatment for dysmenorrhea has yet been given us that is universally accepted but most gynecologists agree on one point and that is the surgical relief of dysmenorrhea has up to the present, been the most successful and comonly accepted. It is necessary to mention that no case of dysmenorrhea should be subjected to surgical procedure until careful, scientific attempts are made to relieve the condition by means of medication, glandular

therapy, and general upbuilding of the patients nutrition.

Various types of operations have been described in the literature which will be classified according to the surgical technic employed. They are as follows:

- (A) Dilatation with or without curettage.
- (B) Division of the anterior and posterior segment of the uterus.

(A.) Simple dilatation with or without curettage:

First and foremost is simple dilatation which dates back to early medicine. This procedure was employed over 2500 years ago by Hippocrates, the Father of Medicine. His idea was based on the fact that dysmenorrhea came about from stenosis of the cervical canal which occluded the free flow of menstrual products and hence gave rise to pain. Whether the pain is due to the above entirely or to a spasmodic contraction of the circular fibers at the internal os, to an undue amount of connective tissue at this point, or to another and entirely extrapelvic cause, we have no way of determining, and it must be granted that the employment of a method which is strictly local for the correction of a condition which may or may not be local in origin is entirely illogical. On the other hand common sense must be evoked because

what the patient is after is relief no matter what the etiological factor is. Consequently no controversy over therapy should result or alter the procedure undertaken so long as results are achieved. The average gynecologist reports 40 per cent of permanent cure, to which ~~must~~ be added at least 30 per cent of partial or temporary cures. This mode of therapy (surgical) still remains the commonest form of treatment and probably gives the highest percentage of temporary cures. Schworer and Wichmann (31) reports similar results with use of Menge's method of dilatation.

The gynecologist who bases his objections to this procedure on strictly academic grounds forgets that even temporary relief from dysmenorrhea is usually very gratefully received by the woman who suffers from it. More than one patient has reported that the months of relief thus afforded her have enabled her to get her physical and nervous balance, so to speak, so that when the dysmenorrhea recurred--and the recurrence is frequently of a less severe type--the monthly ordeal was by no means so trying. This is a very important consideration. It is easy to conceive, as has already been pointed out, that with the constant recurrence of pain, which is often very severe if not actually disabling, nervous exhaustion

is likely to follow, and that, as time goes on, the effect of each period will last longer and the reaction from it will be less prompt, so that eventually a constant nervous irritation is maintained and the patient becomes thoroughly neurotic though it would be most unfair to say that her neurosis is primary. Therefore it seems that a definite neurasthenia does not contraindicate the performance of dilatation and curettage, provided that the pain is of the typical type and that the pelvic findings furnish the proper indication.

The operation should be done only in the cases in which the uterus is of the typical anteflexed, hypoplastic type and in which there is no other pelvic pathology such as retro-flexion, tumors or inflammatory disease to explain the menstrual pain. Many gynecologists believe that dilatation alone is sufficient, and that curettage should not be done routinely. It is preferable to employ it in most cases for two reasons; that it is a useful diagnostic measure to eliminate small fibroids which escape detection by the ordinary bimanual examination, and that, even if the bleeding is actually scanty, it is often found in these cases that the endometrium is much thicker than normal and that the patient is benefited by its removal.

Dilatation and curettage may be performed at any time of the month except during the actual flow, and the pathologist should always be informed of the period of the menstrual cycle, in order that he may pass intelligently upon the scrapings submitted to him. Graduated dilators of the Hegar type are preferable to glove stretcher dilators of the Goodell type, with which the force cannot be accurately gauged and which may cause severe lacerations about the internal os. Tears in this area are particularly unfortunate, for, aside from the fact that the immediate hemorrhage may be severe, healing is never primary, and the resulting scar tissue delays dilatation at future labors and does not permit even the normal degree of softening during menstruation.

Dilatation and curettage can be repeated, if necessary, every year or two, as the relief obtained from it wears off. In some cases gentle dilatation, without anesthesia, may be done each month just before the period, and while the results are not as good as when thorough dilatation is done the ensuing period is frequently much less painful. Cleland (39) maintains that dilatation gives only temporary relief and recommends his operation which will be discussed later. Schmidt (4) reports 30 per cent entire cure, 9 per cent aided considerably, 17

per cent cured for a year or two, but 44 per cent were not benefited with the use of Fehling's treatment of dysmenorrhea. A fenestrated cannula, 5 cm. long, with flaring mouth, is introduced into the cervix, after curettage, and is left for three days. Then the cannula is changed and the uterus flushed with one liter of a one per cent solution of liquor formaldehyde. The change of cannulas and irrigation are repeated two or three times, with three days intervals. The woman must stay in bed for five days to allow observation of temperature. If it runs up the cannula is removed.

If a stem of the Baldwin type is used in combination with the operation of dilatation and curettage, the percentage of good results is considerably improved. Miller (36) and Graves (4) report from 50 to 60 per cent permanent cures by this method. The argument against use of stem pessary is the possibility of infection, but they report no infection in the properly selected cases. It is quite true that the stem is surgically unclean and that the cures that it achieves are entirely empiric, but the same arguments hold as hold for dilatation and curettage. Because it does achieve cures it should be employed in the cases in which it is not contraindicated.

With safety of the method and the percentage of successes it achieves are entirely proportionate to the care with which the cases are selected, the contraindications being more important than the indications. The stem must not be used in the presence of gross pelvic lesions of any sort, and its use in the presence of pelvic infection of any degree is a highly dangerous procedure. Cervical as well as tubal disease must be eliminated by history, bimanual examination and other methods before the stem is introduced, and it must be promptly removed if the patient exhibits an elevation of temperature, pelvic pain, or other evidences of an inflammatory reaction. It is particularly adapted to cases in which the uterus is infantile and undeveloped and lies in a position of anteflexion, and in which the cervix is long and conical and the external os, of the pinhole type. The most marked benefits are achieved in cases which exhibit an increase of fibrous tissue about the internal os, akin to the hypertrophic stenosis seen in certain pyloric pathology, and the cure is supposed, not very logically, to be due to the hypertrophy of the uterus produced by the persistent contractions it undergoes in its endeavor to expel the foreign body. Whatever the reason, if the stem is worn over two or three periods,

more than half of all cases are permanently or temporarily relieved, a percentage of good results that cannot be explained in any way. McCullogh (28) reports good results with the use of his dysmenorrhea tubes. Crossen (18) and Miller (36) recommend the use of the glass stem pessary.

Graves (4) and Ezell (35) and others recommend suspension of the same anteflexion, on the principle that the condition is anatomically the same as retroversion and that equally good results may be expected from surgery. The operation is associated with cervical dilatation, and by the combined method Graves reports successful results in 75 per cent of properly selected cases. One wonders whether the dilatation is perhaps the effective factor; at any rate, it seems logical to perform~~at~~ first and independently, and to resort to suspension only after the simpler procedures has failed to cure the dysmenorrhea.

✓ (B) Division of anterior or posterior segment of the uterus:

This procedure is advocated where the obstruction and stenosis of the cervix~~es~~ are present.

(a) Marion Sims (43) devised the first procedure for relief of dysmenorrhea due to above factors. This consists of curettment followed by merely splitting the

posterior segment of the uterus. This method was not very successful because of asperis and consequently poor union of tissues divided.

(b) Dudley devised an operation which consists in removing a wedge shaped portion from the posterior segment of the cervix. The chief aim of this operation is to shorten the posterior segment of the cervix which overcomes the ante flexion and widens the canal, thus overcoming the stenosis of the internal os. One objection to this is that it produces mutilation of the cervix which later simulates a condition of artificial laceration which often produces symptoms which later needs repairing. Pfannestiel reports a similar operative procedure. Curtis (21) condemns the Dudley operation because he says it is not anatomically or physiologically sound.

(c) The treatment of dysmenorrhoea by anterior hysterotomy is recommended by Blair Bell. The steps of the operation including separation of the vaginal mucosa and bladder from the cervix, dilatation of the cervical canal, incision of the anterior cervical wall beyond the internal os and into the cavity of the uterus, coaptation of the superficial longitudinal muscular fibers of the cervix by interrupted sutures, reposition of the flaps of vaginal mucosa. The author's argument is that dilatation

done under direct vision is safer than dilatation done by the blind use of dilators, that a laceration is more safely made by a direct cut than by undirected force, and that by this method a marked and permanent increase in the caliber of the cervical canal is secured by the ordinary procedure of dilatation. The force of the argument must be granted, but the operation is plainly too extensive to be undertaken for any but the aggravated types of dysmenorrhea, and it is not, according to Kennedy (43), adapted to all cases.

(d) Cleland (39) has suggested an operation based on the theory that the site of the trouble is at the internal os, and that a cure can be effected by severing the ring and producing a sufficiently prolonged dilatation to prevent subsequent contraction of the muscles. Surgical division of the cervix is first done, after which two lateral incisions are made at the internal os, from 1/16 to 1/12 inch deep. A second dilatation is performed, followed by curettage, and the operation is concluded by packing both the uterine cavity and the cervical canal solidly with iodoform gauze, which remains in place for eight days. In 175 cases Cleland failed completely in less than 5 per cent and cured permanently more than 75 per cent of his patients; subsequent pregnancies were

without incident, abortion being no more frequent than usual and labor being either normal or simpler than usual. His results are unquestionably good, but infection seems a possibility with such a method, even in the hands of a skilled and careful surgeon. Asepsis therefore is imperative. Andrews (25) reports very good results with use of Cleland operation.

(e) The Pozzi operation consists of dividing the cervix bilaterally up to the internal os, the wound edges being approximated in such a manner that a permanent, deep bilateral artificial laceration is left. The disadvantage of this procedure is obvious. Abortion and premature labor are frequent in later pregnancies, dystocia is of common occurrences, and another cervical operation may be required to repair the lacerations and to correct the cervicitis which often follows the erosion and eversion produced in the cervical tissues. Cleland (39) avers that this is not a good method because the internal os has been cut. Graves (3) objects to the Pozzi operation in that an endocervicitis usually results.

(f) Cotte (34) of France suggests pelvic periarterial sympathectomy in treatment of dysmenorrhea without lesions of the genitalia, in pelvic neuralgia with pains

in the ovary, uterus, or utero-sacral ligaments. He reports the curing of 5 patients by resection of the adventitia of the hypogastric artery, with no recurrences to date, which covers a period from six to fourteen months. He also reports good results with severance of the pre-sacral nerve. The resection of the pre-sacral nerve did not produce any disturbance in the bladder or rectum. Novak (23) and others suggest that these cases would have to be followed through subsequent pregnancies and labors to be certain that the musculature of the uterus is not damaged or weakened by the severing of the nerve.

(g) Violet (33) advocates the stretching of the uterine nerves, at the base of the broad ligament as a therapeutical measure in dysmenorrhea. He believes that a chronic parametritis of the uterus irritates the uterine nerves. His technic consists in the separating of the adherent tissue, severing the sclerosed fibers, and stretching the nerves, after an incision in the posterior layer of the inflamed ligament was made. He reports complete cure in four cases treated in this manner. The cure in one persisted 10 years and was still successful while the other three have just been operated on six months ago and have had complete relief since.

Psychic Measures.--

Psychic therapy is perhaps the least painful and expensive, yet most beneficial form of therapeutics the physician can institute.

With this in mind he should obtain a careful history, especially as to the time of onset of the dysmenorrhea, and a possible correlation of this event with a psychic trauma of one sort or the other. This should be stressed more because whatever the cause of the first attack may be, there is always the possibility that the factor of fear may lead to recurrence and perpetuation of the symptoms. Each case therefore, should be individually evaluated.

The gynecologist should also determine whether the dysmenorrhea has been brought about as a result of improper instruction as to the naturalness of the menstruation process, stressing that it is a normal and natural function. These patients usually show improvement upon receiving the information. This further indicates that one must recognize the type of patient he is dealing with.

With some patients it is wise not to mention operative procedures until less radical methods have failed. A combination of personality of the physician and his assurance that he has had success with his treatment is often sufficient to cure many cases of dysmenorrhea. A

few minor therapeutical procedures combined with this often is beneficial.

Novak (23) is of the opinion that "cervical dilatation is psychic rather than a real factor. One cannot be dogmatic, but there can be little question that in many cases the operation is a form of psychotherapy, at times successful, although not infrequently only temporary." Many others agree with Novak in his deductions.

Peterson and Cross report that some cases of dysmenorrhea are benefited by carbon dioxide insufflation of fallopian tubes. Moench (30) reports partial relief in 20 per cent of the 14 cases treated as such. The pressure used in each case was 140--90m.m. of mercury. This was used where the cervical canal was very narrow. Patients with anteflexion, salpingitis, perioophoritis, and prolapsed ovaries were not benefited. Moench inserts a cannula in the cervical canal so as to permit the insufflation. He attributes the relief from dysmenorrhea as being due to the actual passage of carbon dioxide. One would be inclined to believe that the passage of the cannula produced enough cervical dilatation to relieve the patient. Regardless a good method for treating psychic patients with dysmenorrhea has been introduced which might impress the patient very much and often

provide satisfactory results.

No definite treatment of psychogenic dysmenorrhea can be instituted that will benefit every case, and to consider all methods used would result in a paper very voluminous. The type of Psychic Therapy, therefore, can be described in a few words--use any method that will impress the patient that she is receiving treatment which has been proved to be extremely successful and also that clears up any mental anguish or worry she has.

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