

URINARY INFECTIONS IN THE PRACTICE OF OBSTETRICS.

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Competent observers have called attention to infections of the urinary tract, occurring during pregnancy, or following upon labor, and recent literature contains many interesting articles pointing out the great importance of this condition. Nevertheless, sufficient consideration is not yet being paid to this complication, and the majority of the profession do not seem to realize the frequency of its appearance; therefore, we wish to bring the subject again before their notice. We believe that most of these cases are either overlooked or wrongly diagnosed, and we feel that the ease in prophylaxis, and the ready response to early treatment, ought to inspire every one of us to keep this danger constantly in mind.

Clinically there are two well-defined divisions: The first division consists of those cases which occur during pregnancy, and which at first sight appear to be idiopathic; here the infection is a descending one, and is caused by bacteria eliminated through the kidneys. In the second division, we have the infections introduced during or after labor; they start at the external meatus, and are ascending in character.

The two processes are widely different, and a review of the etiology will serve to show that each class has its own definite causative factors.

Etiology.—In all branches of medicine, it is accepted, that any obstruction to the flow of urine will constitute a great predisposing cause for inflammatory changes along the urinary tract, and that in the presence of such an obstruction, bacteria, otherwise harmless,

can find a ready foothold. Furthermore, it has been demonstrated that the urine flows from the kidneys under a very low pressure, and that the slightest impediment may be enough to cause a partial retention within the pelvis.

Now, when we consider that the ureters occupy a very intimate relationship with the non-gravid uterus, and when we remember that the space between the wall of the true pelvis and the ureter measures only about one inch, it is easy to understand that as pregnancy advances to the point where the body of the uterus rises out of the true pelvis, and is developing in the abdominal cavity, how its borders come nearer and nearer to the ureters, and push them over to the bony superior strait, against which it compresses them. Again, the uterus in its enlargement, pulls upon the ureters, and this has a tendency to flatten their walls, and to diminish their lumen.

That this pressure may be sufficient to obstruct the urine and cause a dilatation of the ureters, is shown by the fact that if the ureters of women dying in pregnancy be examined they will, in the latter months, frequently be found dilated. Where the condition is bilateral, it is the right which attains the greater dilatation: where only one ureter is involved, it is usually the right.

The predisposition for infection to attack the right side rather than the left depends on several factors: In its ascent, the uterus becomes inclined to one side, usually the right, and at the same time, it undergoes some axial torsion from left to right; consequently there

is a tendency to encroach more upon the space occupied by the ureter on the right side, and, besides, the right kidney is anatomically lower, and hence more subject to pressure and traumatism, thus diminishing its resistance and predisposing to infection. Again, as suggested by Meeks, the greater prominence of the right over the left iliac artery, and the greater frequency of the foetal head in the right oblique diameter, may play a part, especially in the last two months of confinement.

Since the compression of the ureters is etiologically so important, and since the pelvis of the right kidney is affected in over one-half the cases, the explanation is plain as to why nearly all the cases of urinary infection in the course of pregnancy, are cases of right sided pyelo-nephritis, and also why they all develop after the fifth month. With the field prepared for the localization of infection, as described above, yet the presence of bacteria, in sufficient number and virulence, is of course essential, and these arrive from two directions; coming down from the kidney, or traveling upward from the urethra, the first route being the usual one in the vast majority of cases commencing before labor, bacteria being poured out from the kidneys in enormous quantity.

Thirty per cent. of pregnant women will show urine so loaded with micro-organisms, as to give rise to the clinical picture of bacteriuria, an attack of constipation frequently being ample to render the urine hazy with the germs. Here the bacteria are practically always bacilli coli communi, entering from the intestines and passing out through the kidneys; there is generally an excess of Indican present, and the condition clears up promptly with a purgative.

In a very few cases before labor, the gonococcus, if already in the urethra, may avail itself of the impeded flow to ascend the urinary tract. Turning now to those cases which follow labor, we find that the infection consists of the staphylococcus or streptococcus, which

has been introduced through the external meatus, and that here, the great predisposing cause is improper technic in asepsis.

Let us always remember that the meatus opens directly on the field of operative work, and furthermore, that the bladder and urethra are subject to unavoidable traumatism and pressure during labor, so that this furnishes a very inviting avenue for infection, if the greatest obstetrical cleanliness has not been employed.

The use of the catheter is another potent source of infection, for the germs being present already or entering during parturition, are apt to be lighted up by a catheter passed with every precaution, because of existing contusion or abrasion.

We should not overlook, too, an infection which passes by way of the uterine lymph channels to the tissues around the kidneys, and is associated with the formation of perirenal abscesses; in pregnancy, these lymphatics are much increased in size, often reaching the magnitude of a goose quill, and they form a plexus under the peritoneum, which is continuous with the general lymphatic system, and anastomoses especially with the perirenal lymph vessels.

Having thus pointed out the methods of invasion, let us see how infections of the urinary tract manifest themselves.

Onset and Symptoms.—Practically all cases, whether ascending or descending, announce their onset by the symptoms of a cystitis; in some patients, where the infection has been introduced through the meatus, of course, a true cystitis is present, but even where the lesion is limited to the pelvis of the kidney, as in most of the pregnancy cases, the first symptoms are usually from the bladder, and consist of a pronounced frequency of urination, accompanied by a slight burning sensation; these symptoms are not due to a cystitis, but are referred from the kidney, the bladder being reflexly stimulated to repeated contractions.

All the cases that I have observed have com-

menced in this way, and have presented their other symptoms in quite regular order; after the cystic manifestations, the patient next complains of headache and dull pains in the back and limbs, followed in a few hours by a more or less severe chill, with high temperature and later sweating.

The chills vary in intensity, and may occur several times a day, every day, or at irregular intervals; at times these chills are quite periodical, resembling malaria.

The temperature does not pursue any typical course, it is generally of an intermittent character, rising sharply and dropping equally so; the subnormal fall is usually very marked. In two recent cases, the rise would begin about 11 a. m., and reach its height about 6 p. m., being subnormal again by 10 p. m. On the other hand the rise may be very abrupt, attaining a high mark and being sustained for some days, gradually declining.

The aching and tenderness in loins which accompany the chills and rises of temperature may be insignificant, or may be so severe as to require the use of morphia; when it is sudden and early in appearance, it is due to a contraction of the ureters, trying to force the urine past the obstruction, and this pain will disappear in 48 hours, when the muscular coats are paralyzed.

The signs of urinary toxemia do not show themselves until the inflammation becomes chronic, then delirium, stupor and other symptoms may be alarming, and the patient be gravely ill.

Particular attention has to be paid to the urinary findings, which are fairly constant; first and most important is the presence of a bacteriuria and the test for albumen is generally positive; most physicians will recognize the albuminuria, but will take no notice of the bacteriuria, thus entirely misinterpreting the true condition by attributing the trouble to a renal insufficiency, instead of making a correct diagnosis of urinary infection. Cloudy or al-

buminous urine in pregnancy should always be investigated for bacteriuria.

The urine is always acid, except in those cases of chronic ascending infection, where the reaction may be alkaline.

Casts are present in proportion to the nephritic involvement, and very significant is the finding of pus in varying quantity, the amount bearing a close relationship to the intensity of the symptoms, thus when drainage is good and urine is full of pus, tenderness and fever are low, but when pus collects in diseased ureter, behind the obstruction, then constitutional symptoms reappear, though urine is voided clear and limpid.

Whenever there are intervals of complete absence of pyuria, it always indicates that one of the ureters is normal, and this is of importance from a prognostic standpoint.

After abdominal or vaginal operations, the surgeon is apt to attribute the symptoms to a pelvic ooze, mild wound infection or to auto-intoxication from the intestines, and when urinary infection occurs in the course of typhoid, scarlet fever, diphtheria or pneumonia, the medical man, overlooking the complication, will often think that there is present an exacerbation of the original disease. Likewise in the practice of obstetrics, when this condition happens, a mistaken diagnosis is frequently made.

Differential Diagnosis.—Because of the severe chills, many cases are thought to be of malarial origin, but here a blood examination would at once establish the diagnosis; the absence of the plasmodium, the presence of leucocytosis, with a relative increase of the polymorphonuclears, and the resistance to quinine, would dismiss malaria, while the urinary findings and other symptoms would establish the existence of urinary infection.

When the pain in the right loin is very severe, appendicitis might be suspected, and differentiation is made by the history of the case, by the urinary examination, and by the localization of the tenderness, with the absence of

marked rigidity and distention; nausea is a late symptom in urinary infection, while it is an early one in appendicitis.

There is also little doubt that many a case of chills and fever, following labor, is diagnosed and treated as a uterine infection; the pyelitis pursuing its characteristic course, uninfluenced by the iodine applications, curettements, and irrigations of the long suffering uterus. All temperatures occurring after labor call imperatively for a microscopical examination of the urine, to determine the possibility of an infection of the urinary tract.

The diagnosis is made from puerperal sepsis, by the absence of uterine symptoms, such as fetid discharge, tenderness or subinvolution of the uterus, while the history of the case, and the presence of bladder symptoms will direct your attention towards the true condition.

In three cases which have been seen during the past year, the original diagnoses were respectively, malarial, appendicitis, and puerperal sepsis of a mild character; indeed they simulated these conditions very closely. Salpingitis and perinephritic abscesses are to be recognized by the local signs; typhoid also has to be thought of, but once in mind, the diagnosis is generally easy.

When the obstetrician has recognized the fact that an infection of the urinary tract is at hand, then the course and prognosis of the disease will depend on whether the bacteria are limited to the vesical area, or whether the condition is also present in the ureter, for the symptoms of a pyelonephritis may resemble, and are often mistaken for a true cystitis. In cystitis the urination is very painful, and there is great tenderness elicited by vaginal examination; in pyelonephritis, while there is a marked frequency, there is no real pain on urination, and vaginal examination is painless.

Course and Prognosis.—The prognosis for the child is more serious than for the mother, since, when the infection is accompanied by a very high temperature, particularly if sus-

tained for some days, spontaneous abortion is likely to take place.

For the mother, the dangerous cases are those which are not recognized until uremic symptoms appear, and also those where the infection results from a catheterization, and is progressively ascending in character. The descending infections are less dangerous, and many cases of a mild nature get well in spite of no treatment at all, or else treatment along the line of a mistaken diagnosis, yet it is an unfortunate thing if these mild cases do not receive the proper treatment, for a pyelonephritis may persist without symptoms, for a long time and eventually lead to interstitial changes within the kidneys.

If an infection once gains a firm standing during pregnancy, it can not be entirely cured until after labor has taken place, at which time there is always an exacerbation, but this will subside much more readily than the former attack, and after delivery the urine will gradually clear up. One attack renders the patient more susceptible at a subsequent pregnancy.

Induction of premature labor never has to be performed, except in cases seen very late after the kidneys have become severely damaged, for even the violent infections, if recognized at an early stage, will yield nicely to treatment, if rationally and intelligently administered.

Treatment.—The general management of pregnant and puerperal patients is of great importance; they should receive water in abundance, their diet should always be restricted, their bowels regular, and a careful watch kept for bacteriuria; on its appearance, purgatives and urinary antiseptics will suffice, if administered promptly. If, for any reason, a chronic gonorrhoeal infection of the urethra or vagina is suspected, then urinary antiseptics should be given throughout the latter months of pregnancy. We should employ, as a routine prophylactic measure, the administration of some good urinary antiseptic for a few days before, and at least for a week after delivery.

This is particularly urgent if the labor has been a hard one, or if operative work of any kind was resorted to. A careful asepsis during labor and the puerperum is of course essential, together with the avoidance of catheterization if possible; we can often succeed here by allowing the sitting posture, by pushing water freely, by mouth, and by the use of a hot saline enema or douche; a hot water bag over the pubes, and a hyperdermic of strychnine will also help. By such general measures as these the great proportion of cases can be prevented, and those infections which do occur can be greatly alleviated, and the patients can be conducted in safety and comfort to labor; after labor there is usually a flareup, due to the traumatism of muscular exertion. This will yield nicely to treatment, and in some months the patients are cured.

The active treatment for all urinary infections consists of rest in bed, water very freely by mouth, saline enemata as often, and in as large quantities as possible, liquid diet and purgatives.

Urinary antiseptics should be commenced at the beginning, and should be continued for some weeks after all symptoms have disappeared.

Symptomatic treatment is also of service, thus an ice-bag or morphine for pain, cold sponges and an ice-cap for high temperatures; hot water bottles, and hot blankets for the chills, etc.

The efficiency of the general treatment, and the necessity for each one of the measures mentioned is well illustrated by a recent case. A patient with a moderately severe ascending pyelonephritis of gonorrheal origin had been treated during four weeks for malaria, with a progressive increase in symptoms; when first seen she was very toxic and stupid, with chills and high temperature. Proper treatment being instituted as described above, she cleared up entirely within four days, and remained without any symptoms for seven days, when she was removed from the hospital to a boarding-house. Here there was a renewal of symp-

toms, apparently due to the exercise incident to moving. These disappeared in two days, and she then went on to full term, a period of over one month and a half, but during this time of waiting she suffered from three slight attacks, brought on respectively by constipation, indiscreet eating, and by letting up on the amount of water she was ordered to drink. The trauma of labor caused a reappearance of symptoms, which came on the second day and lasted for five days. On being moved from the hospital a week later, symptoms again appeared and lasted for three days. After this there was no further return of the condition, and when heard from last, about six months after labor, she was apparently perfectly well.

CONCLUSIONS.

1. Urinary infection is a common complication in obstetrics, and its possibility should be borne constantly in mind.
2. The urine of pregnant women should be routinely examined for bacteriuria, and on its appearance, vigorous treatment should be instituted.
3. Before commencing treatment for temperatures occurring after labor, we should always inquire into the possibility of urinary infection.
4. We advise the prophylactic employment of urinary antiseptics in all cases of labor.
5. The treatment of this complication is eminently satisfactory, and induction of premature labor rarely has to be performed.

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