



MEDICAL SURGICAL SUBQUESTIONS

VOL VIII

NO. 3

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MEDICO-SURGICAL SUGGESTIONS

Vol. VIII.

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A MONTHLY JOURNAL OF PRACTICAL MEDICINE & SURGERY

Editor: Dr. P. R. Venkappaya.

VOL. VIII

MARCH 1939

No. 3

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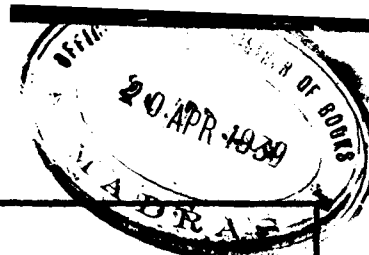
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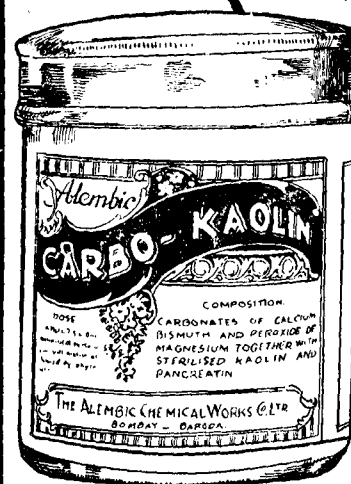
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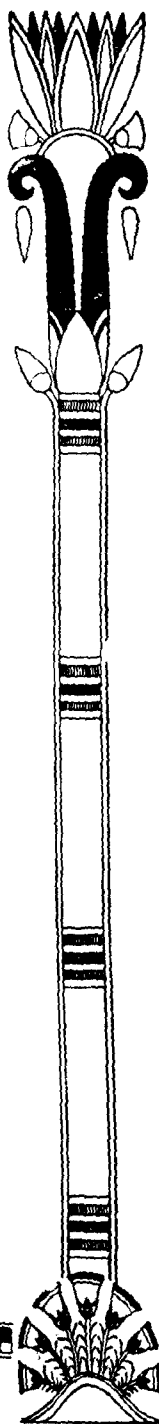
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MEDICO-SURGICAL SUGGESTIONS

VOL. VIII

MARCH 1939

NO. 3

Original Article.

"SWERTIA CHIRETTA".

BY DR. S. K. GUPTA, B.D.S.C., B.O.

Laboratory Clinic (Analyst),

Railway Road, PASRUR, District Sialkote (Pb).

SYNONYMS.

Sanskrit—Bhunimba. Hindi—Chirayta.

Bengali—Chireta, Chirata, Chiretta.

SOURCE.

The dried plant, Swertia Chireta, Collected when it blooms, and then again it is dried up and made ready for medicinal use.

HABITAT.

It is a native plant of India, hosts of Swertia Chiretta plants, are found in jungles of Nepal and other Northern parts of India; from whence the major part of world's demand is supplied.

CHARACTERS.

Chiretta is a vegetable bitter recognised by British Pharmacopoea. It is one of the few Indian drugs which are able to attract the attention of British Physicians. Though dried Chiretta is well known, a short description of the entire plant is given here. The plant is rather short—two to three cubits in height. The growing plant looks somewhat reddish or orange colour. The branches of the plant, are thin which arrange themselves on the upper part of the plant. The lower part of the plant is more or less rounded whereas upper one is angular. The branches are thin, slender and decussate. Leaves are ovate, opposite in their growth arrangement and each of them has five to seven ribs on each leaf. Small flowers grow luxuriantly paniced on the plant. The fruits are superior, bicarpellary and unilocular. Swertia Chiretta has got no odour and tastes extremely bitter.

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When ordering please mention *Medico-Surgical Suggestions*.

PREPARATIONS.

- (1) Infusum Chiretta.
- (2) Tinctura Chiretta.
- (3) Essence of Chiretta.

The last one is not a B. P. preparation. According to British Pharmacopoeia, the action of the drug is anthelmintic, carminative and stomachic. Whereas indigenous medicine claims it to be anthelmintic, carminative, stomachic, antipyretic, antiseptic, bile regulator, relieves nausea, alleviates inflammatory reaction, i.e., uneasiness due to fever, etc., and last but not the least as curative for leprosy.

DISCUSSION OF ACTION AND THERAPEUTICS.

As an anthelmintic, it is to be injected up the rectum to have any effect on thread worms whatsoever. Its use in dyspepsia due to the fact that it increases saliva, gastric juice and the peristaltic movement of the stomach and the intestines to some extent as well.

So far, we have discussed common therapeutic values recognised by both British Pharmacopoeia and indigenous medicine. Now, we shall try to consider other remaining therapeutic values one after another as claimed by indigenous medical system.

We often come to know from patients that they themselves prepare and use infusum Chiretta (generally made in cold water) as domestic remedy in slight degree of pyrexia with occasional fall down of temperature. So there lies some truth about its antipyretic action.

Let us now think over the antiseptic value of the drug. Although I am not in a position, at present, to support its antiseptic property with decisive attitude yet I admit that my clinical results have inspired me to prescribe this drug along with other medicines where I suspect bacterial infection. Its efficacy as a bile regulator is rather due to the fact—it accelerates the flow of bile. As bitterness causes the flow of gastric juice; this acid chyme in its turn in the cause of bile to come to the alimentary canal. According to indigenous medicine perception of heat at the regions—Sole of the Foot, palm, of the hand and the eye lids due to stagnation of bile. We also observe in some cases report of relief by using the drug in such cases. It sometimes relieves nausea—not all types of nausea—but that kind which is produced by the toxins of round worms and thread worms. Uneasiness and heat on account of inflammatory reaction, may often disappear by the use of the drug by proper quantity of it for a length of time provided the inflammatory reaction is not too serious. As regards its administration against lepra bacillus I personally have got no experience of the merits and demerits of the drug neither I was able to trace out any record from elsewhere perhaps it is an exaggeration attributed to the quality of the drug Chiretta.

CONCLUSION.

All the preparations namely, infusum, tinctura and essence are bitter as they contain *Chiratin*, one of the main constituents of the drug. Of the three, infusum is more easy to prepare—it requires only boiling water and dried turigs of Chiretta with the proportion 20:1. As both the B. P. preparations are standardised by means of weight and the active principles of the drug, vary to some extent in different samples. Laying aside the question of B. P. preparations, if the essence of Chiretta is prepared with a standard concentration of Chiratin, the usefulness of the drug may be appreciated to a greater extent by the consumers atleast. So I beg to draw attention to our Indian drug Houses in this respect.

Chiretta is a tannin free drug, so, it can be combined with other drugs without much difficulty excepting its bitterness. It is more extensively used as domestic remedy by laymen than by physicians in India. I hope that this drug in a stable form in the hands of my able brethern, will do much for the suffering mass of this country.

Modern Methods of Treatment.

THE TREATMENT OF GONORRHEA IN THE MALE*

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CHAPTER VIII

CHRONIC PROSTATITIS—TREATMENT

The keynote of therapy in chronic prostatitis is digital massage *per rectum* of the infected gland. However, it must be emphasized that massage during the acute manifestations of the infection is definitely contraindicated. To do so not only invites distressing complications, but no therapeutic good is derived from the procedure.

The beneficial results obtained from massage of the chronically infected prostate are unique and hardly paralleled by any similar therapeutic procedure. We do not know the exact details as to why infection is eliminated from the prostate by massage. Doubtless the mechanical propulsion of infected material from the glands and their ducts is an important but not a complete explanation for its benefit. Probably as much good follows the absorption in the blood stream of toxins and possibly bacteria induced by the massage and which in themselves produce an autovaccinating effect in the individual. Of minor importance is the reduction of congestion and improvement in circulation incident to the manipulation which favors cure. With those principles in mind, it can be realized that massage performed too frequently or too roughly defeats the very reasons by which it traces its therapeutic effectiveness; the gland becomes irritated and the system overly perfused with antigenic substances before their full curative effect is obtained.

Prostatic massage is performed using a very definite technic. Because many have not mastered the principles of its correct application explains much of the disappointing results obtained. One caution must be followed; and that is pain should never accompany the procedure. The production of pain either means that the technic is in error or the prostate is too acutely inflamed for such treatment.

A properly performed prostatic massage is begun by placing the patient in the knee chest position on an examining table. The finger is inserted in the rectum—*well lubricated*—and follows the gland upward as far laterally as possible with its ball pressed rather

firmly down. The amount of pressure is dependent somewhat on the acuteness of the disease process as well as the tolerance of the individual. As the ball of the finger is brought forward parallel with the urethra, there is gained the impression of "give" to the deeper glandular tissues. The rectal mucosa must be disregarded in obtaining this sensory impression. Care must be exercised not to press or rub the superficial tissues but endeavor to obtain the peculiar feel of "springy resistance" that the glandular tissue imparts to the massaging finger. The sensation is not unlike that which one gains in the process of expressing milk from a cow's udder. Each stroke must follow straight down from base to apex of the prostate and not in a circular or transverse course. Four to five strokes, each one progressively closer to the mid-line for each lobe is sufficient for a treatment with the last maneuver bringing the finger straight down the mid-line and out of the anus which evacuates the massaged secretion past the sphincter to the urethral meatus. It must be inferred that massage should never produce pain, but should be vigorous enough to achieve results. Extreme gentleness is often inadequate for therapeutic results. However, judgment in this respect must be gained by observation and practice.

Massage of the prostate should not be performed more often than every three to five days; more frequent than this induces irritation and less often is not productive of much benefit. Prostatic massage performed over long periods of time is also conducive to irritation. Ten to twelve treatments over a six-week period is sufficient for a course, following which it is advisable to allow a period of rest from this type of treatment.

What is to be done about the secondary urethritis in these long standing, persistent infections of the prostate? In the majority of instances the inflammation of the urethra seems to be of incidental importance and one observes as the prostatic focus improves the inflammatory reaction of the urethral mucosa tends to disappear spontaneously. Nevertheless, it may be necessary to direct the attention toward cleaning up an annoying catarrh in this region. It may be treated under two headings: medical and surgical.

Medical treatment comprises filling the bladder full of 1:8000 permanganate solution or some other mild antiseptic of similar concentration, and then performing massage followed by an evacuation of this solution. A stronger solution, preferably of the silver salts is then instilled by anterior-posterior technic and allowed to remain for a short time. If the case is quite recent, *i. e.*, within three or four months of initial infection, anterior-posterior injection is the preferable method of achieving bladder filling; but if it is not quite so early a catheter may be used.

*This is the third installment of "Gonorrhea in the Male." Previous installments appeared in the January and February, issues of The Journal.

Occasionally the physician has to resort to instrumental means for combatting infection in the prostate. As has been mentioned before, long standing irritations induce hyperplastic changes in the urethral mucosa from the stimulating effect irritating discharges have on the epithelium. Whenever these are present it is practically a futile gesture to treat the prostate and expect much results. Happily this does not occur very often; however, it is a possibility which one must consider as a complicating factor in each instance where there is a failure in response to therapy.

The easiest method of destroying these infiltrations, or hyperplasias is the passage of a large caliber sound several times at intervals of a week or ten days. Unfortunately this accomplishes little good in the majority of cases and one must then resort to more strenuous means of treatment. By the use of an instillation of one or two cc. of one to three per cent silver nitrate instilled carefully in the posterior urethra, with a posterior instillator, a mild cauterizing effect is produced. It is probably wise to initiate such treatment using a slightly less concentrated solution in order to test out the tolerance of the individual. Two or three of such treatments will be usually found sufficient.

It must be understood that the rationale for the cure of the disease is purely for the purpose of correcting what surgical pathology is present and which is complicating a cure from the infection by hindering proper drainage from the glandular acini of the prostate. One should never use such treatment without asking himself whether the infection is sufficiently attenuated and dormant to merit such procedures. Probably there is no justification to use solutions of such strength for at least six or eight months following the initial attack of gonorrhea and it probably would be better to wait a year. Certainly if a definite stricture exists in the urethra the indication for instrumental dilatation is obvious. To use instruments earlier and without a definite therapeutic object in view is inexcusable and often disastrous.

Lastly, in a very, very few cases endoscopic or cystoscopic treatment may be indicated in order to obtain a cure. It is not within the province of this thesis to deal extensively with this phase of the problem other than to state it is no procedure for the inexperienced. Much irremedial harm has been done by the promiscuous use of so-called therapeutic endoscopic procedures. It is safer to treat a few extra months conservatively than to resort to such measures too early and injudiciously. They are literally last resorts of therapy.

As adjuncts to the treatment of chronic infection of the prostate are a rather important phase of the therapeutic attack it is well to discuss them at this time. The administration of three or four injections of neo-salvarsan, 0.3 to 0.45 gm., intravenously, is

frequently followed by a rather rapid resolution of the infection. These injections are given at five-day intervals and are particularly indicated in the presence of coccal infections arising from focal origin. One must be careful for the development of toxic reactions in the use of the drug.

Of late, sulfanilamide has been added to the list of drugs useful in the treatment of chronic infections of the prostate. It is administered in doses of thirty to forty grains daily, and its greatest value seems to be demonstrated in the earlier stages of gonococcal infection. However, in a few instances, much therapeutic good seems to be derived from its use in non-specific infections. In our experience sulfanilamide exerts its best benefit within the first ten days following its administration. If no improvement is noted in this length of time, it is practically useless to continue longer. We have also noticed that the drug seems to lose its effect when given over a period of time. Patients in whom a relapse of the infection has occurred, after taking the drug, will obtain little benefit from the administration of the drug when it is prescribed a second time.

Non-specific therapy in the form of foreign protein has many advocates and probably holds some value in the stimulation to cure. A favorite in our clinic is a preparation termed Omnadin, dispensed in ampoules and administered subcutaneously every two or three days in courses of six to eight injections. Little or no reaction arises from its use. In some cases it seems to aid in clearing the infection more rapidly.

Vaccines of a mixed character, preferably of an autogenous origin are also used. The prostatic secretion is cultured for whatever organisms are present and a vaccine is made from this growth. It is administered in ascending dosages for an indefinite period of time, the results obtained are variable but this method of treatment has sufficient background of success to be worthy of trial in refractory cases.

The use of heat administered locally to the prostate in the form of hot water rectal irrigations either by the open method using a short two-way rectal irrigation tip or by the closed method described as the Elliott treatment has been tried but has been found of doubtful value, except as a palliative treatment in acute manifestation of the disease. The former method has been found preferable so far as acute prostatitis is concerned. The patient may apply the procedure in his own home using a connecting tube to his hot water supply and inserting the two way nozzle in the rectum, adjusting the flow of water so far as temperature and pressure are concerned to suit his comfort. Because of the complexity of the apparatus and the bulkiness of the prostatic bag used in the Elliott treatment, this method has been found somewhat impractical in the routine treatment of prostatitis.

A procedure that probably should merit some consideration is the injection of medicaments directly through the perineum to the prostate for the purpose of sterilizing the gland. Mercurochrome is the drug recommended and is used in one per cent solution. The patient is placed in a lithotomy position and the needle directed through the perineum to the prostate with the aid of a finger in the rectum, as a guide. The prostate is injected in both of its lobes, three to five cc. of the solution to each lobe. The procedure is accompanied by considerable pain on the part of the patient. Beneficial results are reported by others, but a limited experience in our clinic has not proved particularly successful. The danger of inducing extensive sclerosis with the development later of a vesical neck obstruction to the urinary stream is a complication that should be borne in mind.

One may advise the patient who is suffering from chronic infection of the prostate that the element of time had best be forgotten. Two months to achieve a cure is remarkable. Four months is the usual amount of time many cases require to obtain results. One should never forget the general health, the daily hygiene, and rather important, the conduct that pertains to the sexual activities. It is probably wise to restrict sexual intercourse completely, even in the very chronic long standing cases.

CHAPTER IX

ACUTE EPIDIDYMITIS

The onset of epididymitis during the course of gonococcal infection is always a discouraging complication of the disease. Not only does it produce a distressing period of disability for the affected individual, but because its presence demands a cessation from regular treatment, chronicity of the infection is favored. However, of greater importance as far as the patient is concerned is the possibility of permanent sterility from an occlusion of the vas of epididymis following the inflammatory reaction. Fortunately, in most cases the disease involves only one side.

As regards the diagnosis of epididymitis, it is well known that students, as well as many doctors, call any painful swelling of the scrotal contents an orchitis. It is well to keep in mind the majority of acute inflammatory conditions within the scrotum are epididymal, arising in most instances from either a gonococcal, non-specific or a tubercular infectious origin. In most cases the infection can be traced from a similar prostatic or seminal vesicular disease focus, but occasionally epididymitis may occur from a hematogenous origin, from a focus elsewhere. Orchitis is a relatively rare disease entity and almost invariably is related either to mumps or trauma. The gonococcus practically never produces an orchitis.

In the examination of inflammatory conditions of the scrotal contents, the physician should learn to palpate the various individual

anatomical structures in order to form an exact diagnosis. Even in instances where a gonococcal origin seems obvious, he should think twice before stating the condition is due to this disease. Repeated smears from the urethra and urinary sediment examined for the gonococcus were found negative. The presence of nodulation of the vas with thickening, and finding the same condition in the prostate, is the typical appearance of genital tuberculosis.

One clinical entity that may be mentioned is torsion of the cord. It is almost always confused with epididymitis and resembles it in its clinical onset. As early surgery is imperative in such instances, it is well to keep this condition in the list of diagnostic possibilities. A point of differentiation between the two conditions is when a severe, painful, scrotal swelling is not relieved by a firm strapping of the testicle, but on the contrary if pain seems to be aggravated a torsion is to be suspected.

What are the predisposing etiological factors responsible for an acute epididymitis during the course of a gonococcal infection? As has been discussed in the chapter on acute posterior urethritis, poor conduct on the part of the patient or mismanagement of the disease by the physician are potent reasons for the development of this complication. Sexual excitement, long automobile rides, the imbibing of alcohol and various other indiscretions by the patient are important contributory factors for the development of epididymitis. Prostatic massage during an acute posterior urethritis, early instrumentation, traumatizing instillations and irrigations on the part of the physician are often followed by epididymitis. Epididymitis has also been said to result from a reflux of infected urine up the ejaculatory duct and down the vas. For this reason, a wise precaution during gonorrhea is to warn the individual to not allow his bladder to become too distended during a gonorrheal infection.

The treatment of acute epididymitis may be medical or surgical. The medical treatment comprises essentially of cessation of all local treatment including massage of the prostate together with complete bed rest and proper immobilization of the scrotum by either an adhesive suspensory or a figure of eight muslin bandage. The technic for applying these dressings may be obtained from any standard text book. The administration of sedatives is usually necessary for the relief of pain. Cold applications are comforting, but the application of heat to the testicle through local diathermy has proven more efficacious in our hands in the shortening of the course of the disease. Provided the individual can tolerate the drug during the acute phase of the infection, sulfanilamide should be administered. In many cases particularly of gonococcal origin it seemed to definitely have some curative effect in lessening the swelling and relieving the pain. Daily intravenous administration

of calcium gluconate has also proven a valuable adjunct to other treatment and seems definitely to alleviate some of the pain.

Under the above regime the great majority of patients are free of most of their pain and are able to return to light activities within three to five days. It must be emphasized that relapses will occur unless care is exercised not only by the patient, but by the physician in his management of the disease. The scrotum must also be constantly immobilized, with a well fitting suspensory for an indefinite period of time. If the average drug store support is used it should be carefully fitted as often there is allowed to much movement of the parts. Failure to properly immobilize the scrotum following an attack of epididymitis is a factor responsible for many recurrences.

Surgery in the form of epididymotomy is occasionally necessary when pain is not relieved by ordinary methods or a suppurative process is definitely present. However, surgery is rarely indicated in most instances. The statement that sterility results less often when epididymotomy is performed early, requires statistical proof which we have failed to find.

One word of warning that bears repetition is urethral injections and especially prostatic massage should not be begun too soon after an acute attack. Because of the possibility of an exacerbation of the infection at least a week should elapse and then caution must be exercised with the first few treatments as often these predispose to a recurrence of the process.

CHAPTER X.

MINOR COMPLICATIONS—BALANOPOSTHITIS.

Because of the irritating effect of the discharge on the glands and foreskin, this annoying complication is seen rather frequently, especially in those of negligent habits. The patient should be impressed with the importance of bathing the parts often with a mild soap and water. The dressing that serves to collect the discharge should be changed frequently and it may be advisable to use some sort of antiseptic dusting powder if there is a tendency toward skin or mucosal exfoliation.

When a rather inflammatory condition is present as manifest by edema and pain, hot permanganate soaks (1:8000) will be found helpful. In individuals who have a redundant foreskin, the added swelling of the prepuce produces a phimosis which if not easily retractable will allow infection beneath to assume serious destructive proportions. This is especially evident when a chanoroidal infection is present. Patients with tight prepuces should be warned to be careful in retraction of that structure past the corona especially when difficulty is encountered doing so because of the possibility of producing an irreducible paraphimosis. In such instances irrigation of the sac several times daily should be advised.

Ulcerative lesions beneath an irreducible phimosis should not be treated conservatively for too long a time; surgical steps to improve drainage should be taken as serious destruction of the tissues of the glans and even the urethra may result. The physician in such instances should "dog-ear" the foreskin by means of lateral incisions of sufficient length to allow the prepuce to be retracted so as to obtain adequate exposure of the infected area. This can be done under block anesthesia by injection at the base of the penis. Because of the infection, the high frequency cutting current is the safer method of performing the incision followed by electrocoagulation of the bleeding points. No sutures are taken and the organ is dressed with dry iodoform gauze with the same dressing used thereafter. At a later date when the infection is controlled a plastic circumcision may be performed trimming up the redundant tissue under local infiltration anesthesia.

As regards the urethral infection it is probably better judgment to disregard for the time being. Routine urethral treatment may be resumed when the external tissues have resumed a more normal state. It is also well to keep in mind that any ulceration involving the genitalia should suggest to the physician a syphilitic infection; dark field examinations of the serum from these ulcerations should be persisted in, in order to prove or disprove the presence of this disease. A follow up of a blood Wasserman should be also insisted upon for several months following such a complication. The patient should further be advised, in instances where ulceration has occurred around the urethral meatus that stricture of this region will probably occur and this will require dilatation for an indefinite length of time.

DIFFUSE PERIURETHRITIS WITH CHORDEE.

Peri urethral inflammation with involvement of the corpus spongiosum is a frequent painful complication of the disease. It is present to some degree in practically every patient the first ten days of his infection. When severe it produces a condition termed chordee which is a painful, downward crooking of the organ on erection resultant from the inflammatory fixation of the urethra to the adjacent tissues. To forcibly straighten out such a penis is a therapeutic brutality and should never be done; hot penile soaks is a more rational method of obtaining relief.

PERI-URETHRAL ABSCESS.

This painful complication is rather common, especially in those patients in whom the urethra has been subjected to extreme trauma in the form of strong medication, high pressure irrigations or instrumentation during the acute phase of gonorrhea. Judgment in draining the abscess must be exercised. Preliminary hot packs will soften and localize the infection and not rarely abort the process by inducing spontaneous drainage of the gland by way of the urethra;

however surgical drainage usually becomes necessary in most instances. As soon as the condition has been thoroughly localized, under local anesthesia a longitudinal incision is made into the swelling thereby evacuating its contents. This incision must not be carried too deep as the urethra will be entered and a permanent fistula develop. It is probably well to desist from all local treatment during this acute complication for fear of encouraging this latter condition. Fortunately, unless the fistulous opening is extensive, subsequent urethral dilatation will almost always be followed by satisfactory closure.

LYMPHADENITIS AND BUBO.

Enlargement of the adjacent inguinal glands is not necessarily a complication of gonorrhea as it is rather a constant finding to some degree in each instance of the disease. Unless secondary infection occurs, usually in the form of the bacillus Ducrey, no fear should be held that they will suppurate; gonococcal lymphadenitis is rarely productive of pus. Lymphangitis manifesting itself as a "whipcord-like" swelling of the superficial lymph vessels along the dorsum of the shaft, occasionally develops. These acute inflammatory conditions demand little more than hot fomentations to the affected region and which usually results in rapid improvement.

CHAPTER XI.

PROOFS OF CURE.

No more perplexing problem confronts the physician treating gonococcal infections than the decision that the patient is completely free from the disease. Despite the common belief held by many of the laity and not a few physicians, gonorrhea can be permanently cured. The recurrence of the disease about which one hears so frequently, occurs usually in those who at all times have slight but definitely demonstrable evidence of infection. In most instances an examination will reveal shreds in the urine or pus in the prostatic secretion. Certainly the probability of cure is further reinforced when indulgence in alcohol or sexual intercourse fails to activate the disease.

Time is the essential factor that proves the cure of gonorrhea. It may be stated that the longer an individual goes without recurrence, the more positive the physician may be that a cure has been obtained. An arbitrary period of approximately three months following cessation of all signs and symptoms of the disease may be considered sufficient in order to assure the individual of his freedom from gonorrhea. Rarely will the infection recur where no positive signs are present after such a period of time. Glandular structures wherein the gonococcus become totally sealed will become spontaneously sterilized in this length of time. However, in the interest of safety to the sexual partner, intercourse without condom should not be allowed for some time after that.

At this point it is well to emphasize the dangers incident to sulfanilamide therapy as it pertains to this aspect of the disease. The addition of this drug as an adjunct in the treatment of gonorrhea, because in many instances it obliterates all the signs and symptoms of the disease quite early, holds an element of danger as regards infectiousness not generally appreciated. In our experience, in only a small percentage of patients for whom the drug is prescribed, will there be followed a rapid complete eradication of the infection within a matter of days. The great majority of individuals who are given this medication will show a relapse of infection sometime within the first three or four weeks. It is true, active discharge is lessened even to the point of clear urine in both glasses, but infection of a sub-clinical degree is doubtless still present as indicated by a recurrence of discharge. In a few, the administration of sulfanilamide seemed not to shorten the course of the disease but actually lengthen the time necessary to obtain a positive cure. The stained smears in such instances will show few, if any, organisms but the gonococcus is still present as manifested by the constant appearance of slight but definite muco purulent discharge and shreds in the urine. Doubtless, in these, the drug exerts some inhibitory effect on the organism which consequently hinders the development of the maximum immunological response.

In those patients in whom a relapse has occurred, we have found it requires eight to ten days following cessation of the medication before discharge reappears. When relapse does occur little good is derived from administration of the drug a second time. Sulfanilamide therapy shows the best results the first few weeks of infection. However, chronic cases of gonorrhea who have not been given the medication previously, respond very satisfactorily to this form of therapy.

In view of this experience, we feel the physician now holds a greater responsibility than ever in the proper control of the infected individual in order to prevent him from infecting others. Heretofore the presence of a constant purulent discharge has a deterrent to the individual so far as his transmitting the infection to others. With this absent, unless the patient is repeatedly and emphatically warned by his physician to exercise caution in this regard, an infection will result in an innocent party. Because of this fact we especially wish to deplore the tendency by physicians of prescribing this medication with no complete follow-up management of the infected individual.

Because of the above reasons patients in our clinic undergoing treatment for gonorrhea are managed little different than in the past. Sulfanilamide is given but more dependence is placed on tissue stimulation by regular daily local treatment in addition to other therapeutic measures. We feel that the cure of gonorrhea is based

on the development of a definite tissue immunity to the disease, slowly built up and this requires weeks to become effective. The conduct of the individual undergoing treatment is an all important factor and only by seeing these patients frequently can we obtain the best standards of co-operation. Little promise of an early cure is held to the individual despite the optimistic evidence of clear urine and no discharge. After three or four weeks of such routine treatment we observe the case for an equal length of time and then endeavour to activate any possible latent infection that is present by the administration of vaccine and the passage of sounds.

Unless the profession in general realize this particular limitation in the use of sulfanilamide for the treatment of gonorrhea, society will see within the next few years a spread of this disease to a degree hitherto unknown.

How may the physician evaluate the probability of cure? A review of the progress of the case under treatment will be found of prognostic value in this regard. If the treatment response has been uniform, that is, there has been a gradual diminution of signs and symptoms without relapses, he may feel confident that immunity has been effectively and completely acquired. On the contrary, if the patient required an unusual length of time to recover, and his clinical course was marked by repeated exacerbations of inflammatory activity, the complete cure of the disease should be viewed with suspicion. Quite often these patients will harbor a quiescent foci in some tiny gland that will explode into clinical activity at the slightest provocation. But, as stated before, rarely will these patients be completely free from all signs of the disease. Invariably massage of the prostate or a centrifuge specimen of the urine will reveal some evidence of inflammatory reaction.

What is the clinical evidence of cure? To tabulate:

1. Three months must elapse in which the individual is free from all manifestations of the disease.
2. No microscopic evidence of inflammation must be present following examination of the urethral secretion, the centrifuged urine and the prostatic secretion. Such examination should be performed at least three times, at intervals of three or four days.
3. The passage of a medium caliber sound must not be followed by any purulent discharge and what secretion is produced must be examined and found free from any specific bacteria.
4. Indulgence in normal sexual activity as well as the drinking of alcoholic beverages must not produce any evidence of disease.

In conclusion it is well to advise a blood Wasserman test to be performed some time before dismissal, even when definite local

evidence of syphilitic infection has been lacking. As this disease is contracted usually in the same environment as gonorrhea and as an intra-urethral chancre may be masked by a gonococcal infection, one will occasionally diagnose a syphilitic infection which otherwise would have gone undetected.

[THE END]

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ICTERUS IN THE NEWBORN

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Icterus of the newborn is divided by Helmreich into the following groups: Icterus neonatorum, icterus gravis, septic icterus, luetic icterus, and icterus due to congenital atresia of the bile ducts.

Icterus neonatorum occurs so frequently it is usually referred to as "physiologic jaundice of the new born". Helmreich, in Vienna, found 80 per cent of full term babies, and 100 per cent of prematures jaundiced. It has been variously estimated that from 15 per cent to 100 per cent of newborns are icteric. The disparity of statistics in this regard is probably due more to technique of observation and standards of selection of cases, than to actual variations of the occurrence of icterus in various communities. Bonar suggests that there are three distinct degrees of icterus neonatorum, viz., latent, transient and true icterus. In the first group, there is an increase of bile pigment in the serum, but no tinting of the skin. Rood Taylor found that all the newborns he examined had latent icterus, showing icteric indices over three times that of the normal adult. In transient icterus, "the tint is light, and there is no staining of the tissues, the coloring being due to bile in the lymphatics". In true icterus, there is a deposition of bile pigment into the tissues.

Aside from the tinting of the skin, and perhaps some drowsiness, there are rarely any untoward symptoms in icterus neonatorum. The stool contains bile, while the urine is usually free from bile pigment. The pigmentation is first noticeable on the trunk, and about the neck. If a more extensive jaundice develops, the extremities, mucous membranes and conjunctiva are usually involved in turn. The recession follows the reverse order, and is complete in ten days to three weeks. Examination of the blood shows an increase in bilirubin content which may be measured by icteric index, the spectrometer, and the Van den Bergh reaction. The indirect diazo reaction of Van den Bergh is given, indicating the extra hepatic origin of the pigment.

Like so many of the common phenomena of life, a complete understanding of the etiology and pathogenesis of physiologic jaundice has been difficult to attain, and investigators still quibble over the relative importance of various factors. Its universal occurrence, its limitation to the first week of life, its self-limited course, and its uniformly benign character require one to seek an explanation in the anatomic and physiologic peculiarities of the newborn.

Before precise laboratory methods were available, anatomists sought a complete solution of the question in mechanical factors influencing circulation of blood about the liver, and flow of bile into the intestine. Pinching of the bile ducts between the lobes of a swollen liver compressed by the moving diaphragm, was Hasse's explanation. Others sponsored such theories as swelling of Glisson's capsule; obstruction of the large bile ducts by desquamated cells and mucus; a catarrhal inflammation spreading from the duodenum. All of these theories would explain only an obstructive jaundice, which did not fit with the clinical picture of bile filled stools and bile-free urine. Quinke's notion that bile pigment was absorbed by the immature intestinal mucosa, and short-circuited directly into the blood stream through the ductus venosus, was more tenable, but failed to fit in with more recent observations.

Minkowski removed the livers from geese and found the geese developed no jaundice. From this, he deduced that without the liver there can be no jaundice; that is, that all bile pigment is made, as well as excreted, only by liver cells. This influenced the reasoning of Knopfmacher, and Ylpo, who believed that more bile was formed than the ducts could carry, and was consequently excreted from the liver cells back into the blood.

When Van den Bergh applied the diazo reaction to icteric blood serum, he found that bilirubin from cases of bile duct obstruction gave a color change immediately (a so-called direct reaction), while in hemolytic icterus, a reaction was obtained only after precipitating the serum protein with alcohol, an indirect reaction. This gave a means of discerning the origin of bilirubin. In applying the tests to newborns, Grulee in 1925, and others since, have found that in icterus neonatorum, the indirect reaction is uniformly obtained, indicating that the bilirubin has not been excreted by the liver cell, and reabsorbed into the blood, but is of hematogenous origin. Cases of indubitably obstructive jaundice, however, did not always give the direct reaction, in this way not conforming to the findings in the adult. Therefore, we may still be unable to entirely rule out some resorption of bile, as suggested by Quinke.

Time does not permit a review of all the work upon which the present day conception of icterus is based, but a few established facts, and a statement of the modern theories may be of value. The fetus living in a state of anoxemia, due to the inefficient aeration of

the fetal blood, develops a compensatory increase in red blood cells and hemoglobin, so that there is a distinct polycythemia at birth. With oxygenation after breathing has been established, a rapid reduction in red cells takes place, freeing hemoglobin which is split by the reticuloendothelial cells in the capillary bed to bilirubin, and a colorless iron containing fraction. Thus the bilirubin content of the blood, which is already high in all babies at birth, is further increased.

Lereboullet found more bile pigment in the blood from the umbilical artery than from the umbilical vein, indicating that before birth bile is excreted through the placenta. The interruption of the placental circulation at delivery cuts off this route of excretion.

It is believed that the function of the liver cells is not to make bile pigment, but to selectively excrete that which has been brought to it from the phagocytic cells of the capillary bed. While the normal adult liver cells would very rapidly pick this bilirubin out of the blood, and excrete it in bile, the liver cells of the newborn are not capable of handling this extra load efficiently. This is possibly because of the accumulation of thick bile in the small bile ducts which have been shown histologically to be greatly distended or is possibly due to suppression of excretory function from injury of the cells by anoxemia or toxins. The infant kidney also is resistant to excretion of bile pigment, as evidenced by the bile-free urine in the milder cases.

Czerny, Keller and Unger believe that liver cell injury is secondary to bacterial development in the intestine with the absorption of toxins, or the organisms themselves, through the easily permeable intestinal mucosa. This would explain the occurrence of apparent epidemics of icterus frequently encountered, and their observation that thoroughly cleaned nurseries might be free from epidemics for many months. However, the very early occurrence of the jaundice, and its absence in slightly older infants with really severe intestinal infections, makes it unlikely that intestinal toxemia is a major factor in all cases of icterus neonatorum.

As yet eluding satisfactory explanation is the selective distribution of the pigmentation in various tissues, and the variation in the intensity of the jaundice in different individuals with the same icteric index. There is evidently a capillary threshold determined by factors influencing osmotic tension.

It seems logical, then, to consider icterus neonatorum not as a disease, but as a symptom brought about by a variety of forces and condition peculiar to this period of transition from parasitic to autonomous existence.

The incidence of icterus neonatorum was noted in 3,000 babies born in twelve months in the normal obstetrical ward of Cook County Hospital, in 1931 and 1932. Of these, approximately 45 per cent were Negro, and 55 per cent were white babies. They were examined

once in the first week of life, and the incidence of icterus and other variations from the normal were recorded. 737, or 24.4 per cent were more or less icteric. The percentage of icterus varied with the age at examination. It is probable that the actual rate of occurrence of clinical icterus is best shown by the 1,610 babies examined when three, four, five, and six days old, of whom 495, or 30.7 per cent were visible icteric. The skin pigment of the colored babies evidently interfered with the interpretation, for in only 11 per cent of these was jaundice noted, compared to 35 per cent in the whites. At this rate, the icterus incidence in the white babies observed between the fourth and seventh days is about 41 per cent.

The visibility of icterus also varies with illumination. A case readily noted in bright sunlight may be scarcely discernable on a dark day, and may show no tinting if observed by a yellow artificial light. All the examinations in this series were made by daylight before a large window, but not in direct sunlight. The monthly variations noted may be partially accounted for by the poor light during the winter months.

The physiologic type of jaundice is usually said to appear on or after the third day of life, and before the tenth. However, of 597 babies examined when one day old, 53 or 8.8 per cent were somewhat icteric. The histories of all of these were carefully checked, and it was found that none developed severe jaundice, nor was their progress affected.

Inasmuch as prematures are said to be more frequently jaundiced, it is of interest to note that in this series only 21.5 per cent of babies weighing under 5.5 pounds were jaundiced when examined, while icterus was present in 25 per cent of the babies of average weight, 5.5 to 8.5 pounds, and in 18 per cent of the oversized babies. These figures for the small babies are undoubtedly too low, because many were examined on the first day, before jaundice appeared, and others were not removed from their incubators for examination before the seventh or eighth day.

Parmelee has described the underdevelopment of the newborn breast as an index of immaturity. A comparison of the occurrence of icterus and the degree of breast congestion shows a higher incidence of jaundice (29 per cent) in those with deficient breast development than in those with average development (24 per cent), while of those with excessive congestion, only 15 per cent were jaundiced. This suggests that breast congestion is a better index of immaturity than is an arbitrary weight standard.

Icterus Gravis. Babies who become deeply icteric during the first day of life face a more serious condition than physiologic jaundice. Icterus gravis is often a familial disease. Infants so affected develop an intense jaundice which begins a few hours after birth. The

amniotic fluid and membranes may be yellow. The patient is extremely toxic, often feverish and may have convulsions and skin hemorrhages. The blood smear examined in the first day will often show a marked erythroblastosis. Death may occur within the first week. Those who survive, particularly those whose blood contained many erythroblasts, may become edematous or develop an extreme anemia, or both. At autopsy, many nests of hyperacetic hemopoietic tissue are found outside the bone marrow, notably in the liver, spleen and kidneys.

The condition is regarded by some as an immaturity of the hemopoietic system with young, easily destroyed red blood cells dumped into the circulation, the jaundice anemia and edema being varying symptoms of the underlying disease. Others believe it due to toxins which cause hemolysis and which may or may not stimulate a marked bone marrow response accounting for the appearance of the nucleated red cells in the peripheral circulation.

An interesting neurologic complication of icterus gravis is kernikterus. Zimmerman, and Yannet have reported cases of icterus gravis which at autopsy showed deep pigmentation of the basal ganglions; and the nuclear masses of the brain, identical with kernikterus described in the adult. One two-year old spastic child with a thetoid movements had a history of recovery from icterus gravis, and showed at autopsy degenerative lesions in the areas usually affected by nuclear icterus.

Most observers believe early transfusion is a life saving measure in the treatment of icterus gravis. Blood smears should be made early on all babies becoming icteric on the first day. Intramuscular blood should be given at once, and an intravenous transfusion of about 75 cc. of matched blood should be given to those cases showing erythroblastosis. At Cook County Hospital, some babies have made good recoveries with repeated intramuscular blood injections, and without intravenous transfusion.

Septic and Luetic Jaundice. Septic and luetic jaundice result from a hepatitis produced by the invading organisms and their toxins. Some authors group them as subheadings of icterus gravis. Fuchs, for example, divides icterus gravis into those cases with erythroblastosis, those with sepsis, and those falling into neither of the first two groups. Sepsis, and syphilis must always be ruled out in a differential diagnosis of severe newborn jaundice. Luetic icterus is not uncommonly accompanied by an erythroblastic response. This fact speaks against the erythroblastosis being the pathogenic factor in the idiopathic cases of icterus gravis. Sepsis producing jaundice most commonly results from an infectious thrombosis of the umbilical vessels. The prognosis in septic and luetic icterus is bad, and the treatment is that of the underlying condition.

Obstructive Icterus. Jaundice from congenital obstruction of the bile ducts is characterized by onset in the first days of life with a gradually deepening icterus, bile-free stools, bile pigment in the urine, usually a direct Van den Bergh reaction, slowly increasing toxicity, hemorrhagic diathesis, and death in a few weeks or months. The lack of jaundice at birth supports Lereboullet's idea of an antenatal placental excretion of bile, previously mentioned.

Kass and Osgood recently reviewed the literature on obstructive jaundice. Few cases were found that had lived beyond three months, and none over one year. Holmes has stated that in 84 per cent the basic pathology is such as to preclude hope of surgical relief. In a few cases there is a single obstruction in the common duct permitting anastomosis of the gall bladder and intestine, but by the time diagnosis is made, and surgical intervention attempted, so much liver damage has usually occurred that recovery is not possible.

A high carbohydrate diet protects the liver from damage, and prolongs the life of these babies. Kass's case lived twelve months. While hemorrhages usually develop as the jaundice increases, this is not always so. The mechanism of a hemorrhagic diathesis in icterus is not understood.

(*Illinois Medical Journal*, Jan. 38)

THE TREATMENT OF OSTEOMYELITIS AND SEPTICEMIA BY BACTERIOPHAGE.

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One of the most difficult problems confronting the modern surgeon is that of dealing effectively, and finally, with his old enemy, latent infection. For centuries men have sought an ideal treatment for infected wounds. We hear of boiling oil, incinerated toads, ashes and natural balsams, and even sarried perfumes and soft music. The late War made popular the Carrel-Dakin irrigations and bipp treatments. Following the War, maggots came into vogue. In view of this long-continued search, it seems scarcely possible that a method of wound treatment, which may completely revolutionize all our previous concepts could be devised; yet I believe the bacteriophage to be just such a method.

Osteomyelitis is one of the most common forms of bone infection encountered by the surgeon today. Nearly everyone is familiar with the treatment of this condition proposed by Dr. H. Winnett Orr in

1923. Apparently violating the traditions of free drainage, he packed the saucerized wounds with vaseline and vaseline gauze and enclosed it in a plaster cast which was left undisturbed for weeks. Soon after operation the patient's temperature dropped to normal and, upon removal of the cast, the wound was found to be covered with healthy red granulation tissue. Orr explained this startling result on the basis of rest, immobilization, and avoidance of reinfection by repeated dressings.

However, this explanation did not seem to me to account entirely for the marked success of the treatment. After close observation of several cases, I became convinced that some unusual phenomenon was taking place. D'Herella, the Yale bacteriologist, had in 1921 discovered an ultra-microscopic parasite which appeared spontaneously in a culture of dysentery bacilli and destroyed them, thus in many instances saving the patient's life. This he called the "bacteriophage" because it lived on virulent pathogenic bacteria and completely lysed them.

The analogy to the bacteriophage treated wound is obvious. When one closes up the wound with a paraffin vaseline tampon and plaster cast, it is infected and discharging pus. When one removes the dressing eight weeks later, the wound is clean and healthy. Whatever agent clears out the offending infection appears spontaneously, for none has been introduced. And the long lapse of time permits this agent to carry on its bacteridestroying action to a successful end. Is it not logical to assume that the phage principle has been working in the wound, that a native bacteriophage has multiplied and become active under the long-continued dressing?

With this working hypothesis, I immediately proceeded to use this revolutionary method in all cases of osteomyelitis and by careful laboratory search and clinical tests, it was established that, as I had assumed, a specific phage did appear spontaneously in about 94 per cent of cases of acute and chronic osteomyelitis. In 3 of the remaining 6 per cent in which the phage did not appear spontaneously, the laboratory has been able to supply us with a phage specific for the organism in question: but in the other 3 per cent, it has, so far, been unable to do so. This is especially true of the streptococcus hemolyticus, and, in these cases, we have adopted a policy of watchful waiting. In several instances, the desired phage has later appeared in the wound spontaneously, and healing has occurred. It is hoped that with the perfection of laboratory methods and increased knowledge of the phage, it may be possible to isolate races of phage specific for each strain of bacteria in all cases.

In cases of osteomyelitis, both acute and chronic, I now make use of the following method of treatment. I do not use alcohol or iodine as does Orr, lest they interfere either with the development of

the spontaneous phage or with the specific laboratory bred phage after its introduction.

The treatment of group of cases of osteomyelitis complications; such as infected fractures, entails a multitude of considerations. In most of these cases, we have deep wounds extending into the bone, with varying degrees of infection. The ideal wound dressing must, therefore, have a degree of solidity sufficient to restrict the tendency of the orifice at the dermis to close earlier than the depths of the wound. At the same time, this tampon should be such that it can be inserted in practically a fluid state, in order to flow uninterruptedly to every recess of the wound: it should then become semi-solid, thus tending to conserve the original contour of the wound, avoid adherence to the bone, and bit by bit, extrude automatically as granulations fill up the depths of the wound, or as the contractions of healing and cicatrization demand.

I am now using, instead of the vaseline and vaseline gauze applied in earlier cases, a mixture of paraffin and yellow vaselin. The mixture is always put into the wound in a melted state, at about 110 degrees Fahrenheit, this being accomplished by immersing the jar containing the mixture in a water bath for some time before the mixture is used. It is then inserted into the wound by means of a large syringe.

I do not favour the vaseline, vaseline-gauze dressing for several reasons:

1. It is impossible to control satisfactorily the consistency of the vaseline, vaseline-gauze tampon. Due to the ingredients comprising it, this tampon cannot, at best, be uniform in its consistency.
2. Later experience has shown that, even when an excess of vaseline is added with the vaseline gauze, the gauze is still apt to become adherent to the bone at the bottom of the wound and so resist extrusion of the tampon and delay healing.
3. The wound granulations are likely to strangulate through the meshes of the gauze.

None of these complications ever arise with the paraffin and vaseline dressing, which, because of its proper degree of solidity for the particular case, the uniformity of its consistency, and its slippery surface, will always extrude much more satisfactorily than the vaseline, vaseline-gauze dressing, acting in a manner apparently somewhat similar to the bipp tampon. Furthermore, it has been found that the bacteriophage occurs spontaneously just as frequently as with the gauze dressings; also, the laboratory-bred phage, when introduced, acts as favourably. I have been unable to find any shortcomings of this dressing as compared with either the bipp or the vaseline, vaseline gauze dressing. Bipp, however, may be contraindicated because of the possible unfavourable chemical action of the iodoform upon the bacteriophage.

TECHNIC.

The usual sequestrectomy and saucerization are completed and a culture is taken. (If a specific phage has already been found from a culture previously taken from an existing sinus, two thirds of a test tube of this phage is poured into and over the wound, so that the whole surface is bathed.) The wound is then packed with a paraffin and vaseline mixture. No vaseline gauze whatsoever is used. The paraffin and vaseline are heated and poured in as a liquid or forced in by pressure through a large syringe. In most cases, the syringe is the method of choice, in order to insure penetration of the mixture to the innermost recesses of the wound.

One end of a rubber catheter is inserted through the paraffin-vaseline wound tampon to the bottom of the bone cavity. The other is allowed to project through the dressings and cast (which are applied as usual) with a sterile gauze or cotton over the end. If the laboratory examination of the culture reveals that it is possible to develop a bacteriophage specific for the organism presented, the cubic centimeters of this phage are injected through a rubber catheter once or twice a week. Care should be taken when making periodic injections not to infect or contaminate the end of the tube. Should the bacteriophage appear spontaneously in the wound, injection of the laboratory-bred phage is still of advantage in that it accentuates the action of the native phage, and may be a more specific one. The practice is of still further advantage because, if an original phage does not completely destroy a culture, the organisms that survive give rise to a resistant strain which may be pathogenic for its host but is affected by the old bacteriophage. In large wounds, several catheters may be inserted, some of which are multifenestrated. Inasmuch as the catheter is firmly embedded in the paraffin-vaseline tampon, the injected phage fluid cannot flow backward between the catheter and the tampon. It must, therefore, make its way inward between the tampon and the wound granulations, and thus, by reason of its own bulk, spread widely. Furthermore, since the phage is, by nature, a multiplying organism, it will thus automatically spread over the wound surface.

At the end of eight weeks the cast is removed and the wound dressed, great care being taken not to traumatize the granulating surfaces. The discharge around the edges of the wound is wiped off gently with sterile gauze and the skin cleaned with benzine.

If the wound is not entirely healed when the cast is removed, it is again bathed with a test tube of the prepared specific phage fluid and a catheter or catheters inserted to the depths of the wound. A paraffin-vaseline tampon is used as before and a cast applied for an eight week period. A culture is also taken at this time to determine whether the bacterial flora of the wound has changed, and also

whether a more specific race of phage can be obtained. Periodic injections through the catheter are given as before.

I have recently completed a statistical study of 100 consecutive cases treated by this method which shows that the average healing time for a case of osteomyelitis so treated is about six months. Three casts are applied at intervals of eight weeks, and, after removal of the third, weekly dry dressings are done until skin healing takes place. The type of infecting organism varies.--staphylococcus, or a mixed infection with staphylococcus predominating, being the most frequent. It is interesting to note that the *Bacillus welchii* appeared in seven of the series of 100 cases. However, the rod was extremely weak and attenuated and did not interfere in any way with the healing of the wound. The flora changed in 22 per cent of the cases, usually to a more favourable type of organism, resulting in rapid healing.

Those cases in which a native phage develops usually do very well without the insertion of a laboratory-bred phage. However, in view of our latest investigations, we feel it is wise to inject periodically a race of phage of the highest potency, in order to have at work for a maximum period of time a phage of the highest specificity. In this way, any possible decrease in potency of the native phage is offset.

My experience with this new method of treating osteomyelitis has convinced me that it is far superior to any other method I have used, and this conviction is borne out by the statistical study which shows the time of healing materially reduced.

SUMMARY OF THE ADVANTAGES.

1. It is simple in its applications, requiring a minimum amount of labor on the part of the surgeon and his staff.

2. It does not interfere with the immobilization of the part (as, for example, in the case of a compound infected fracture of suppurating joint), nor does it favour edema of the granulations or the soft structures because of inequality of pressure at or in the immediate neighbourhood of the wound, since there is no window in the cast. This is quite contrary to the Carrel-Dakin or maggot method of treatment, both of which must, of necessity, have a window in the cast. I believe that a uniform pressure over the wound and neighbouring tissues (such as this method affords) will avoid exuberant granulations and edema--an important consideration in the healing of a wound, as is exemplified in the case of various ulcers.

3. The paraffin-vaseline tampon automatically yields to the encroachment of granulation, healing, and closure of the wound, thus gradually extruding and keeping up a constant physiological pressure upon the surface of the wound at all times. This is more effective than frequent dressings by the surgeon, and, in addition, avoids the possibility of re-infecting the wound by a foreign flora of bacteria.

4. This dressing is favourable to the appearance of the native bacteriophage and to the periodic introduction of a laboratory-bred phage.

5. It requires a very short period of hospitalization.

In addition to its application to infected bone wounds, the bacteriophage has proved a most efficacious specific agent in combating lesions such as furuncles, boils, carbuncles and phlegmons. For these conditions it may be applied in two ways:

1. It may be thoroughly rubbed over the surface of the wound and the lesion covered by sterile pads soaked in bacteriophage; or, if the lesion is of extensive size or depth, it may be dressed with the paraffin and vaseline tampon with a catheter incorporated for periodic introduction of bacteriophage.

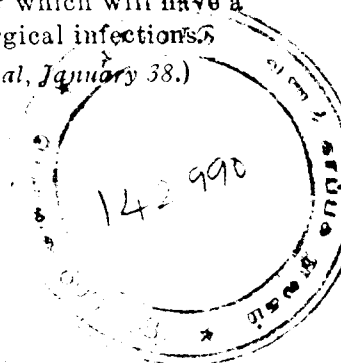
2. It may be injected subcutaneously into the soft parts by means of a hypodermic needle about the periphery of the lesion.

In bacteremia, particularly with staphylococcus, a bacteriophage prepared with asparagin as a medium and injected into the blood stream has, in the hands of Dr. Mac Neal, reduced the mortality from practically 100 per cent to less than 50 per cent, even when there have been two positive blood cultures. Not only is the bacteriophage a successful local therapeutic agent, but it has the added advantage of helping to establish a possible general immunity on the part of the patient. Also the bacteriophage is, to some degree, effective in experimental animals when injected at a site distant from the infected focus.

COMMENT.

The invariable excellence of the results of this new method of treatment for infected wounds should make it unquestionably preferred by all those who experience its advantages over former methods. I believe that the bacteriophage will eventually become one of the surgeon's important weapons against infection. Its potency has become so widely recognized that certain governments (India and Brazil) have passed laws that it be kept constantly on hand for use in certain intestinal diseases. My desire is to stimulate the interest of the surgical world in a phase of bacteriology which will have a profound influence on the future treatment of surgical infections.

(Rocky Mountain Medical Journal, January 38.)



Extracts.

THE PATHOGENICITY OF COCCI ISOLATED FROM THE URINE.

Moe Goldstein, M. D., Fellow in Pediatrics, The Mayo Foundation: *Staphylococcus aureus*, *Micrococcus* (species not known), and *Streptococcus faecalis* are three gram-positive cocci which frequently are isolated from the urine. It is a fundamental fact that the kidney will not excrete bacteria into the urine unless the renal parenchyma has been injured. *Staphylococcus aureus* is known to cause renal lesions almost invariably when it is injected intravenously. No experimental work has been done with the *Micrococcus* or *Streptococcus faecalis* in order to show whether either of these organisms will injure the kidney when they are injected intravenously.

This study was undertaken to determine the pathogenicity of *Streptococcus faecalis* and *Micrococcus* isolated from the urine.

The organisms used in these experiments were the three common gram-positive cocci found in the urinary tract: *Staphylococcus aureus*, *Micrococcus*, and *Streptococcus faecalis*. These bacteria were obtained in pure culture from the urine of patients and were then subcultured on a slant and kept in a refrigerator. The cultures were frequently transferred to a fresh slant. Twenty-four hours before any culture was to be used for injection, inoculation into a dextrose brain broth solution was performed. All injections into animals were made with this solution.

Young male rabbits weighing between 3 and 5 pounds (1.4 to 2.3 kg.) were used. The animal was first catheterized, the specimen of urine being collected in a sterile test tube for microscopic examination and culture. The solution containing the bacteria was then injected into the lateral ear vein of the animal. Forty-eight or seventy-two hours following injections another catheterized specimen of urine was obtained in a sterile test tube for microscopic examination and culture. At necropsy, specimens of urine for culture were obtained from the bladder by searing the surface of the bladder and drawing the urine into a sterile pipet. A complete necropsy was performed on all animals.

An injection of 0.5 c.c. of a culture of *Staphylococcus aureus* was given to each of eleven rabbits. Lesions of the kidney were produced in eight, or 73 per cent. Abscesses of the papillae, which were the most common type of lesion, occurred in seven of the eight rabbits. Pyelitis, which was the next most common lesion, was found in six of the eight animals. Five animals had medullary abscesses and cortical abscesses were found in five. No abnormal elements were found in the urine of two of the three animals in which no lesions were produced.

Fourteen animals received injection of a culture of *Micrococcus*. Nine animals received an injection of 0.5 c.c. of the culture; 2 c.c. of the culture was injected into each of five animals. No renal lesions were produced in any of the fourteen animals. The urine of six of the fourteen rabbits was examined forty-eight hours following injection and the urine of eight of the fourteen rabbits was examined seventy-two hours following injection. No abnormal elements were found in any of these specimens.

A culture of *Streptococcus faecalis* was injected into nineteen rabbits. Each of nine animals received 0.5 c.c. of the culture. Two cubic centimeters of the culture was injected into each of eight animals. Each of two animals received 3 c.c. of the culture.

Lesions of the kidney were produced in seven of the nineteen rabbits (37 per cent). Pyelitis, which was the most common lesion, occurred in five of the seven rabbits. Abscess of medulla, which was the next most common lesion, was found in three of the seven animals. Papillary abscesses occurred in two animals, and cortical abscess, in one. No abnormal elements were found in the urine of five of the seven rabbits examined before injection of *Streptococcus faecalis*. The urine of two rabbits was not obtained. Forty-eight hours following injection, the urine of one rabbit did not contain any abnormal elements, the urine of five rabbits contained pus, and the urine of one rabbit contained gross blood, probably owing to the trauma caused by catheterization.

The results of the experiments with *Staphylococcus aureus* bear out the conclusions of previous investigators regarding the pathogenicity of this organism.

It is of interest that abscesses were more common in the papillae of the kidney than they were in the cortex. Abscesses of the cortex are usually mentioned as the most frequent type of lesion in staphylococic infections of the kidney. The lesions produced by *Staphylococcus aureus* were far more intense than those produced by *Streptococcus faecalis*.

In contrast to the constancy with which lesions were produced in the kidney after intravenous injection of *Staphylococcus aureus* was the complete absence of renal lesions after intravenous injection of the *micrococcus*. Although the original amount of the culture of *Micrococcus* that was injected into fourteen rabbits was increased fourfold as compared to the *Staphylococcus aureus*, necropsy did not disclose any lesions and examination of the urine did not reveal pus or organisms.

The striking difference in the two groups of gram-positive, massforming cocci, when injected into the bloodstream of rabbits, is of definite clinical importance. It suggests that if the *Micrococcus* which is found normally in the urethra, is also present in the vesical urine, it does not necessarily indicate the presence of

infection of the upper part of the urinary tract, whereas the presence of *Staphylococcus aureus* in the urine usually indicates infection of the upper part of the urinary tract.

In the presence of mass-forming, gram-positive cocci in the urine, it is, therefore, of utmost importance to know whether one is dealing with the *Micrococcus* or *Staphylococcus aureus*.

Renal lesions were produced in seven of nineteen rabbits (37 per cent) which received injections of a culture of *Streptococcus faecalis*. A larger dose of *Streptococcus faecalis* than of *Staphylococcus aureus* was required to produce renal lesions. The renal lesions produced by *Streptococcus faecalis* were far less severe than the lesions produced by *Staphylococcus aureus*. The frequency of renal lesions after the intravenous injection of *Streptococcus faecalis*, however, seems to indicate that its presence in the urine is of pathologic significance.

HELIUM AND OXYGEN TREATMENT OF INTRACTABLE ASTHMA

C. K. Maytum, M. D., Division of Medicine: Helium which is an inert gas, is also a light gas; its molecular weight is 4. Its lightness makes it of value in treatment since the lighter a gas is, the greater the velocity of its molecules and the greater its rate of diffusion. In the smaller bronchi, diffusion is of greater importance in aeration of the lungs than is the mechanical movement of the thoracic wall and diaphragm. Therefore, if the nitrogen in the air is replaced with helium, more oxygen carried by the resultant mixture which has an inherent motility three times that of the air will reach the alveoli.

Dr. Boothby compares the flow of air in the bronchi to a stream of vehicles on a crowded highway; the nitrogen and oxygen molecules are represented by their molecular weights as 28 and 32 ton trucks, while the helium molecules are represented by 4 ton trucks. When we remove all the heavy 28 ton nitrogen trucks (80 per cent of the total) and replace them with faster moving, lighter helium trucks, the traffic as a whole is speeded up.

Sayers and Yant (1925) first suggested the use of helium and oxygen for divers and caisson workers. They showed experimentally that animals which had been exposed to 10 atmospheres of helium and oxygen could be decompressed in one-third the time required for air. They suggested that this mixture be used for divers and caisson workers, since the greater diffusibility of the mixture not

only speeded up the decompression time but also reduced the possibility of caisson disease.

Barach (1934) suggested its use in asthma and cardiac disease and in 1935 Drs. Prickman, Boothby and I reported its use with good results in four cases of intractable asthma. Since that time it has been used in many cases at the Clinic and is a most valuable aid in terminating prolonged, severe asthma, when other methods fail give relief.

Until recently, the cost of helium alone made its use almost prohibitive. Furthermore, the rapid diffusibility which makes it valuable in treatment was responsible for much difficulty in administration since helium will leak through apparatus which is perfectly satisfactory for use with oxygen. In addition, when a closed system is used, an attendant, trained in helium and oxygen therapy, must be present at all times to be certain that the concentrations of helium and oxygen are correct as determined by frequent analyses of the mixture in the tent. One other disadvantage in using an oxygen tent is that asthmatic patients almost invariably become panicky when first confined in the tent. The same is true of the ordinary face mask.

The new B. L. B. inhalation apparatus, with its simple nasal or oronasal mask, devised by Drs. Boothby Lovelace and Bulbulian overcomes most of these disadvantages and makes the use of helium and oxygen much simpler and more efficient. With the reduction in the cost of helium for medical use, it can be used much more freely.

Severe intractable asthma or status asthmaticus is a difficult condition to relieve and fortunately only four or five such cases are encountered at the Clinic each year. In these cases, severe dyspnea may last for many days; the usual methods of treatment give little or no relief, and the symptoms become progressively worse. The patient presents a most distressing and alarming appearance. Dyspnea is constant and severe, and marked cyanosis is present. Cough is ineffectual and sputum is scanty and very tenacious. Marked exhaustion follows prolonged dyspnea and inability to sleep. The patients are often dehydrated because the marked dyspnea prevents their drinking sufficient fluids. They become refractory to epinephrine and only slight transient relief follows its administration. Morphine, although it may relieve certain patients, is a dangerous drug to use, especially when given in conjunction with atropine.

The following factors are important and must be overcome to interrupt the attack: respiratory fatigue, exhaustion, apprehension, anoxemia, and dehydration. Also, since it is possible that overdosage with epinephrine may be an important etiologic factor, its use should be discontinued or the amount used considerably decreased.

Oxygen alone gives little or no relief. With the use of helium and oxygen, however, the cyanosis decreases within a few minutes, although there is no appreciable change in dyspnea. After a few hours, the patient begins to breathe more freely and will relax and doze at intervals. After about twenty-four hours, helium and oxygen usually can be used intermittently and oxygen alone may be sufficient.

It is extremely important that sufficient fluids be given, and intravenous administration of glucose usually is employed until fluids can be taken by mouth in sufficient quantity. Sedatives should be given to promote rest and allay apprehension. Recently we have given aminophylline intravenously with definite benefit in a few cases.

After the attack has been relieved, epinephrine again becomes effective and if attacks recur, the usual dose of from 5 to 7 minims gives relief. Examinations can then be carried out and measures instituted to prevent further attacks.

Not only is helium of advantage in intractable asthmatic conditions as aforementioned but in some cases it will relieve minor attacks as rapidly as epinephrine.

Helium and oxygen have proved to be of value in treatment of other obstructive lesions of the respiratory tract. It is of the greatest value in cases of transient obstruction and if the lesion is in the larynx, tracheotomy may be avoided in some cases. This is particularly true in cases of postoperative or traumatic edema of the larynx and of transient paralysis of the cord occasionally seen after thyroidectomy. I consider it to be the most valuable treatment available at present for status asthmaticus and to be of definite value in the treatment of other obstructive lesions of the respiratory tract.

OBSERVATIONS IN 300 CASES OF ACUTE MASTOIDITIS TREATED WITH SIMPLE MASTOIDECTOMY.

(G. C. KREUTZ AND G. L. WITTER: *Annals of Otolaryngology, Rhinology, and Laryngology*. 46 : 1060, 1937.)

The authors' conclusions are as follows:

Surgical incision of the tympanic membrane lessens the duration of pain prior to aural discharge, affords an opportunity to collect uncontaminated cultures from the middle ear cavity, shortens the total duration of the disease, facilitates a more timely operation and lessens the number of complications of acute purulent mastoiditis.

The most common organism to invade the mastoid process is the streptococcus haemolyticus. Pneumococcus type 3 is a most dangerous organism to invade the mastoid bone. It is insidious in its course and more frequently than other organisms gives rise to serious intracranial complications.

Paranasal sinus disease and the presence of infected adenoids and tonsillar tissue are two important factors in the primary etiology and in the chronicity and recurrence of mastoid infection.

Sometime between the 8th and 21st days has been found to be the optimum time to operate upon an acutely infected mastoid bone, during the first week it is unwise to operate as the infection is poorly localised, complications of a serious nature seem to increase if operation is delayed beyond four weeks.

A tempered non-interference policy in post operative treatment of mastoiditis lessens the period of post-operative discharge and care, and is easier on the patient. The authors' statistics indicate the desirability of less interference with the mastoid during the healing period.

Medical News and Notes.

THE TINNEVELLY DISTRICT MEDICAL ASSOCIATION, PALAMCOTTAH.

(Tinnevelly Branch of the Indian Medical Association.)

The monthly meeting of the Tinnevelly District Medical Association was held at the Subramanya Karayalar Public Library, Palamcottah, on the 25th of February 1939. Members numbering 66 including 3 women doctors were present. After Tea and music and magic by Prof. Sharma the meeting began under the presidency of Lieut.-Col., T. S. Shastry, I.M.S. The Secretary read out the minutes of the monthly meeting held at Nanguneri on the 28th of January 1939, which were passed. The proceedings of the Annual General Body meeting of the Indian Medical Association held at Meerut in December 1938, were read out. The letter from the Association of Surgeons of India dated 14th February 1939, was read out.

The following were unanimously re-elected as the members of the Central Council of the Indian Medical Association.

1. Lieut.-Col., T. S. Shastry, I.M.S.
2. Dr. L. Mahadevan, M.B.B.S., (Madras), D.O.M.S., (Lond.)
3. Dr. K. Rama Ayyar, M.B.B.S., (Andhra).

Dr. A. L. Anantanarayana Iyer, M.B.B.S., of Tenkasi, demonstrated a case of Post Encephalitic state Parkinsonian Syndrome, combined with hyperthyroidism in a young adult.

Dr. M. Venkatachalam Chetty, Sub-Assistant Surgeon, read out the following cases which were successfully operated and treated in the Government Headquarters Hospital, Palamcottah :—

1. A case of Myelitis.
2. A case of Fracture dislocation of Spine.
3. A case of "Open Mouth."

The cases were exhibited to the members. The skiagrams relating to them were demonstrated by Dr. G. N. Kantayya, B.A., M.B., B.S. Each case was fully discussed by the members.

Thereafter Lieut. Col., T. S. Shastry, I.M.S., summed up the important features of all the cases and their differential diagnosis in detail. An excellent dinner brought the gathering to a close.

THE MEDICAL PRACTITIONER'S ASSOCIATION, NUZVID

A monthly meeting of the above Association was held on the 19th February 1939 at Nuzvid in the Local Govt. Hospital, with Dr. (Mrs.) N. M. C. Seshagiri Rao, L.M.P. in the chair. The members were entertained to light refreshments by Dr. D. Satyanarayana who was at home to the members. The Secretary read the minutes of the previous meeting which were approved. The following case reports and case demonstrations were made and discussed.

By Dr. V. Ananthachari :—

1. A lady of 20 years—emaciated with disturbed and tender abdomen—impaired digestion—getting a diurnal rise of temperature ranging between 101° to 103° F. Has Amenorrhoea for the last four months. Scanty and sometimes retained micturition. All the members individually examined the patient and opined as one of Tubercular peritonitis.
2. A fatal case of cerebrospinal meningitis in a child of four months.

By Dr. N. Rama Rao :—

1. A case of Bronchopneumonia in a boy of 5 years that persisted for over a month and resisting any amount of treatment. Both the lungs were involved throughout with an asthmatic breathing and spending sleepless nights. The boy used to complain of a vague abdominal pain and on examination the liver was tender and palpable. A previous history of amoebic dysentery was elicited one or two years back of a severe type. After getting vexed with his treatment and before he was advised to shift for a change of climate, a course of emetine injections were thought to be tried tentatively and the very first injection had some marked effect abating cough and

insomnia and after about 6 injections given on alternate days the boy is rid of all the lung trouble. The fever came down to normal and is having sound sleep. Dr. D. Satyanarayana took the members round the Hospital and demonstrated the following cases.

- (i) A case of gangrene of fingers and toes in a female during the later days of puerperium.
- (ii) A case of Asthma and post delivery neuritis developed concomitantly during the puerperium in a multipara.
- (iii) A case of severe pernicious anaemia with impending cardiac failure.
- (iv) Preserved specimen of big tape worms expelled from a patient.
- (v) A case of tubercular bronchopneumonia with symptoms of mucous colitis in a mohamaden male that had come to attend upon his sickly boy admitted into the same Hospital.

All the members discussed for a long time the above cases and case reports and the meeting came to a close by 7-30 p.m.

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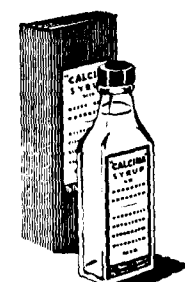
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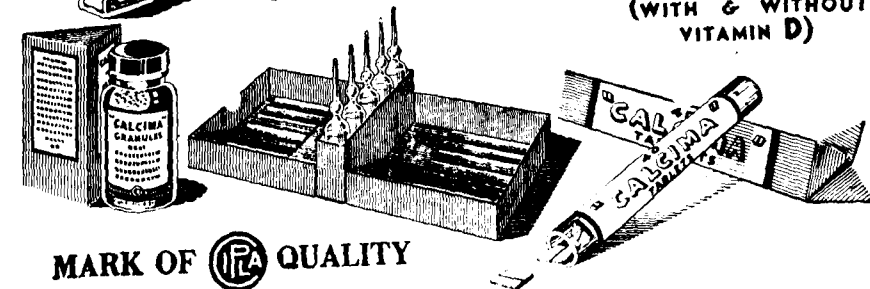
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