

Ingals (E. F.) & Rhodes (J. E.)

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OF TUBERCULOSIS.

By E. FLETCHER INGALS, A.M., M.D.,

Professor of Laryngology, Rush Medical College; Professor of Diseases of Chest and Throat,  
Woman's Medical College;

AND

JOHN EDWIN RHODES, A.M., M.D.,

Professor of Diseases of Chest and Throat-Clinical, Woman's Medical College.

WITH DISCUSSION

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The treatment for pulmonary tuberculosis, proposed by Drs. Shurly and Gibbes, consists of hypodermic injections of solutions of the chloride of gold and soda, or of iodine, and inhalations of chlorine gas. The injections should be made with an absolutely clean syringe which should always be washed with pure alcohol before and after using. The treatment should be commenced with small doses which may be gradually increased until some constitutional effects are observed or until the largest dose recommended is reached. It is usually best, excepting in advanced cases, to begin with the iodine (though it is apt to cause considerable smarting), and it should be continued ten to fourteen days and then it may be given alternately with the chloride of gold and soda solution, and later on (after four or five weeks) the chloride of gold and soda solution may be used alone, if everything is going well. In some patients the chloride of gold and soda answers best. However, I think most benefit will be derived from the iodine solution.

The dose of iodine is from one-twentieth to one-sixth of a grain, and of the chloride of gold and soda, from one-twenty-fourth to one-eighth of a grain. The minimum dose should be used at first and it should be increased by about twenty per cent. each day until the largest dose is obtained unless constitutional symptoms occur. When iodine is used it is to be increased as just directed unless symptoms of iodism appear or unless there is some loss of appetite, disturbance of the bowels or complaint of unusual fatigue. If any of these symptoms occur the iodine may be substituted by the chloride of gold and soda for a day or two

and then given again in diminished doses, which may subsequently be gradually increased. Sometimes while patients are receiving the chloride of gold and soda, in large doses, pains are experienced in the bowels, or in some instances there are uncomfortable sensations in the head; occasionally, also, profuse sweating has been noticed. If any of these symptoms develop the dose should be at once diminished, or the remedy substituted by the iodine. I have recently been using a solution of iodine in oil which was prepared for me by Dr. Clark. It causes very much less smarting than the solution in water, but after ten to fourteen days I have observed that the solution changes so that it must be well shaken before using.

The most favorable place for the injection is on the loose skin, in the gluteal region, and care should be taken that it is thrown simply into the cellular tissue beneath the skin, and not into the muscles, which would cause unnecessary pain. I have found that rubbing the part for two or three minutes after the injection will sometimes greatly relieve what pain it may cause. In ladies where it is difficult to get at the point mentioned, on account of the clothing, I usually make the injections in the back just below the inferior angle of the scapula or between this and the spinal column.

Injections are advised, daily for about two weeks, every second day for the two following weeks, and subsequently once in three, four, five, six or seven days, gradually diminishing the frequency according to the result. When these remedies are acting well the appetite and strength gradually improve, the weight increases and the cough and expectoration gradually diminish. For the first two weeks, Dr. Shurly states, the temperature is apt to be increased, but subsequently, in favorable cases, it decreases until the normal limit is reached. I have frequently found the temperature subnormal in the forenoon, particularly if the patient had been out in the cold.

The iodine seems to act best, but after using it for a time the chloride of gold and soda appears to maintain (at least for some time) the effects produced by the iodine. Where I have used the chloride of gold and soda alone (as has been recommended in advanced stages of phthisis) I have not as a rule obtained as

favorable results as where I have first used the iodine, but occasionally it acts well from the first.

It is very important that the solutions be chemically pure; these solutions I obtain from Dr. J. E. Clark, of the Detroit Medical College, but they may be prepared by any skillful chemist who will consult Dr. Clark's recently published description of their preparation.

The chlorine inhalations may be given either by means of some of the common or specially devised inhalers, or in a room filled with chlorine gas. The latter is applicable to hospitals where small rooms can be arranged; or even to small bedrooms, where it is readily carried out in the following manner:

First, a steam atomizer is made to throw into the atmosphere of the room a solution of chloride of sodium of about fifteen grains to the ounce; this is continued until the atmosphere of the room is so permeated by the spray that a person on the opposite side can taste the salt. One or two teaspoonfuls of chlorinated lime is then placed upon a plate or saucer and wet with a mixture of hydrochloric acid one part and water two parts, which causes the rapid liberation of chlorine gas. This is then held directly under the spray of the chloride of sodium solution and the gas is carried by it into the atmosphere of the room, where the patient sits for ten or fifteen minutes—as long as he can well tolerate the inhalation.

For office use and other places where a room cannot be appropriated for the inhalation, some of the atomizers already in use for giving deeper inhalations, might be employed; but Dr. Shurly uses a glass flask such as is ordinarily used for table water and capable of holding two or three quarts, or in lieu of this a large bottle may be employed for the purpose. This has a hole about an inch in diameter drilled into one side and has fitted upon the mouth a rubber cap such as is used by dentists for their nitrous oxide inhalers. It is placed upon a suitable stand and then a mixture of chlorine water with a solution of chloride of sodium, ten to fifteen grains to the ounce, is thrown by any suitable atomizer, through the opening in the side against the opposite wall of the flask, which breaks it into a fine vapor; the patient at the same time inhales and the air which is drawn in through the opening in the side of the flask takes up a

sufficient quantity of the vapor and chlorine gas. I use the Davidson No. 66 atomizer with from thirty to forty pound air pressure. Physicians who have not a compressed air apparatus may obtain a simple and effective instrument of Sharp & Smith which will answer the purpose well. Some patients do not bear the chlorine well; for these I use, in the same way, a spray of iodine made with four minims of the compound solution of iodine and one drachm of glycerine to the ounce of water. Its effects seem almost, if not quite as good as those of the chlorine. Occasionally patients who are using the chlorine inhalations regularly will experience at some time without apparent cause an alarming sensation of constriction of the chest sometime after the inhalation has been taken.

It is very difficult to obtain a uniform strength of chlorine water, on account of the various methods employed in its manufacture, and because the gas rapidly escapes when the bottle is uncorked; therefore, a solution which may be strong one day may be comparatively weak the next and by the following day may have little effect. I have tried various methods to overcome this objection. First, I placed a definite amount (three or five grains) of chlorinated lime in the flask and added to two ounces of the chloride of sodium solution a half drachm of dilute hydrochloric acid. In this way as the acidulated spray was thrown against the opposite side of the flask it ran down upon the chlorinated lime and liberated the chlorine gas; but I found that at first it was liberated too rapidly if five grains of the chlorinated lime was used, while at the latter part of the inhalation little or no gas would be evolved. Hoping to have the gas liberated more uniformly, I had the chlorinated lime made into compressed tablets, but with these I succeeded no better; for from them very little gas was evolved, and even on breaking up the tablet the amount was not much increased, which seemed to indicate that it had disappeared in consequence of the pressure, or from other causes. I then tried the euechlorine gas, which Prof. Haines suggested to me has greater germicidal properties than chlorine, and is less irritating. This we easily prepared by treating pulverized chlorate of potash with chemically pure hydrochloric acid, but in spite of all precautions we obtained with it a large amount of hydrochloric acid fumes, which were

extremely irritating. To neutralize these I introduced into this solution prepared chalk, but I found that the carbonic acid liberated in this way carried off with it a large portion of the euchlorine gas, so that the liquid remaining possessed only feeble germicidal properties, therefore it was not suited to the purpose. More recently I have used the U.S.P. chlorine water prepared by Hance Bros. & White of Philadelphia, of which from one-half to one drachm to the two ounces of the chloride of sodium solution will make as strong a chlorine gas as can be tolerated by the patient. To avoid the deterioration in strength caused by frequently opening the bottle I adopted a suggestion given me by Dr. Bridge and had several small glass-stoppered bottles filled from the large one, and used from them. In this way it is not necessary to open the large bottle more than two or three times, and a nearly uniform strength of the chlorine gas can be obtained.

I have now been using the Shurly-Gibbes method about eight weeks and have treated by it between forty and fifty patients, but in a disease like consumption this length of time is not sufficient to enable us to draw accurate conclusions as to its effect. Dr. Shurly wrote me in the beginning "that the results were certainly encouraging," and I can from my experience heartily corroborate this statement, yet I cannot say exactly how much good has been done. In most cases which had reached the third stage of the disease with cavities in one lung and the other lung more or less involved, I cannot see that any appreciable good has been done; yet in one of these there has been very marked improvement, the patient has gained strength and weight, has much less cough and fever and as a whole appears very greatly improved, but of the others two have died and with several the treatment has been discontinued because it appeared to be doing no good. With some patients in the second stage of the disease with a whole lobe or even a whole lung involved, we at first appeared to be deriving benefit, but subsequently concluded that the treatment was useless; while in others of this class very decided improvement has occurred. In the first stage of the disease where not more than a third of the upper lobe of one lung has been involved the patients as a rule have been so greatly improved that I expect ere long to say of many of them

that "they have been cured." Three are now apparently well and several others rapidly convalescing.

This treatment is based upon careful experimentation, it is scientific, thoroughly professional and seems to be beneficial; therefore, I hope that the profession will give it a careful trial even to the minutest detail, for it must be remembered that experiments often fail by neglect of some of the details, which to certain observers seem unnecessary. I would not, however, advise the use of this treatment to the exclusion of other remedies which physicians have found of benefit in certain cases, for we cannot experiment upon our patients. I recommend this treatment to patients simply as an additional chance. Many failures will undoubtedly be experienced and recorded; those who use the method in a slipshod way will surely obtain unsatisfactory results, and even though it be employed in the most skillful manner, with the judicious administration of other remedies, there will necessarily be many patients who cannot be cured by it. However, if properly carried out I feel confident that much good will come of it and no harm can result.

Even if only a few patients are cured Drs. Shurly and Gibbes will receive the commendation of the profession and will be entitled to the gratitude of the public for their painstaking and laborious efforts to find some way of curing this dread disease. We congratulate these gentlemen upon having given us, what at present indications is one of the most promising methods of treatment yet discovered for pulmonary tuberculosis; but their work is not yet completed and they and others must work on until instead of twenty-five or thirty per cent. from eighty-five to ninety per cent. of these cases may be prevented or cured.

As supplementary to this paper Dr. Rhodes will read the reports of a number of cases treated by this method during the past eight weeks.

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REPORTS OF CASES TREATED BY THE SHURLY-GIBBES METHOD,  
BY JOHN EDWIN RHODES, M.D.—I wish very briefly to speak of the effects in five or six of the cases treated by this method (now over forty in number).

Mr. M., twenty-four years old, had a catarrhal pneumonia early in January, 1890, but health was fair till September,

when he caught a severe cold, followed by cough, some dyspnoea, loss of weight about seventeen pounds, loss of strength, and considerable pain at lower part of chest on both sides. An examination showed no abnormal signs save heightened pitch, slightly harsh respiration and exaggerated vocal resonance over right apex, early in November. He continued in this condition, being under treatment during November and December with little change. January 13th his pulse was 124, temperature  $100\frac{3}{5}^{\circ}$ , with distinct harsh respiration above right clavicle, with slight dullness and some feebleness of respiration over lower part of same lung. He was pale, weak, had pains in the chest and felt miserably. An injection of  $\mathfrak{m}\text{viii}$ . iodine solution was used, and remedies similar to those he had been taking were continued. Two days later the cough was much looser and the pain was less. He said he could taste the iodine for a day after it was injected. Pulse 104, temperature  $100\frac{1}{5}^{\circ}$ . January 26th, said he had lost six pounds in two weeks. Moist bronchial rales over both sides of chest. The injections were continued about every two days. Soon the cough became softer. The appetite continued fair. On February 2d said he felt better than for a month—gained one pound the previous week; less cough and much softer; was sleeping well. On February 18th said he had an elegant appetite, less soreness and feeling much better in every way. Very little cough, only slight in the morning. This patient continued his work during the treatment. He now considers himself well. His chest signs are decidedly better, and the improvement in all symptoms is certainly marked.

N. C. E., aged twenty-seven, came to the office on December 23d last, complaining of a bad cough, much worse in the morning; grayish white expectoration, about  $\mathfrak{z}\text{ii}$ . every twenty-four hours; some dyspnoea on exertion, fair appetite and digestion, no loss of weight, or much loss in strength. Pulse 102, temperature  $100^{\circ}$ . Signs: Some dullness over inner half of right infra-clavicular region, with prolonged expiration and exaggerated whisper resonance. No rales. There was some slight loss of motion—no other signs. Diagnosis: Slight consolidation of right apex. Placed under appropriate remedies till January 3d, when he was given his first injection  $\mathfrak{m}\text{x}$ . of the iodine solution, and on the 7th reported that he was gaining nicely. After the second

injection said that the cough was much better, and had almost ceased. On 29th, after having the injections every three or four days, his temperature was  $98^{\circ}$ , and had gained two and one half pounds. He has continued as well since that time, save for a day or two after having taken a slight cold.

C. K., on presenting himself in January, complained of having had a cough for a long time, with greenish yellow sputum, some dyspnoea for three weeks, chilliness and fever every day, and had lately begun to feel weak and run down. Pulse 130, temperature  $101^{\circ}$ . He showed marked dullness and bronchovesicular respiration as low as the third rib on the right side, with feeble respiration below this as low as the seventh rib, and at the base of the lung subcrepitant rales were present, with a few friction sounds—thus showing an involvement of the whole lung. ℥viii. of the iodine solution were injected daily, increasing the dose gradually to ℥xx., soon alternating with the chloride of gold solution. He had also the daily inhalations of chlorine. An obstinate diarrhoea appeared about a week after he began the treatment and it was not fully controlled for two weeks. On account of this diarrhoea we reduced the dose to about ten to twelve minims. He continued his work, however, and soon began to improve. Four weeks after the treatment was commenced he felt very well, the diarrhoea had ceased, cough was diminishing, appetite was good and strength fair. Temperature  $98\frac{4}{5}^{\circ}$ , pulse 106. He is still under the treatment, taking the inhalations daily, and the injections every second day. The signs have not changed to any great extent.

Mrs. D. A. C., aged twenty-nine, in December last gave the following history: For two or three years had tickling sensations in throat, with slight cough; was quite weak, but appetite had been fairly good; some loss in weight; a little fever most of the time. Of late had considerable dyspnoea. These symptoms had come on gradually, but about three years ago had a severe attack like pleurisy in upper part of left lung. Mother died of consumption. Expectoration heavy, yellowish. Tongue coated white. Menses very irregular for three years. Pulse 128, temperature  $100\frac{1}{5}^{\circ}$ . An examination revealed a large cavity in upper lobe of left lung, with decided dullness as low as the seventh rib, with subcrepitant rales in lower part of the lung. Right apex also

involved as low as the second interspace. We began with the injections, using  $\text{Mx}$ . iodine at first, gradually increasing the dose day by day, at the same time using daily inhalations of chlorine, and appropriate internal treatment. Her general condition two weeks after the treatment began is noted as being better in all respects save the shortness of breath, with some tightness of the chest, which were probably due to the contraction of the lung noted in some cases by Dr. Shurly. At present she is having an injection of iodine or chloride of gold and sodium alternately every second day. At the time of the last treatment her pulse was 120 and temperature normal. Has had some diarrhea, but was improving in this respect. On the whole I think we may safely say that if we take into consideration the extent of the involvement of the lung, and her general condition, she has done better than we should expect her to do under constitutional treatment alone.

Another case that might properly be suspected as phthisical, but in whom there were no positive physical signs, is of interest owing to the alleviation afforded in one symptom—a distressing, constant, severe cough. He had suffered from it for seven months and many remedies local and constitutional were tried with but little effect. Had lost twenty-five pounds, strength poor, appetite fair. Pulse 126, temperature  $101^{\circ}$ . The cough was peculiar; sometimes having none for an hour or two; then there might be a paroxysm of four or five hours' duration. The expectoration was small in amount. There were no distinct signs. Occasionally a few subcrepitant rales at apices of both lungs. Began injections of iodine December 24th. No perceptible effect on the cough at first. On January 7th had temperature of  $98\frac{4}{5}^{\circ}$ , pulse 108, and said he felt as well as he ever did, but was still coughing a good deal. Improved gradually after that, ceased taking medicine, the cough almost disappeared, and his pulse and temperature were about normal.

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## DISCUSSION.

DR. E. FLETCHER INGALS, in closing the discussion, said: Mr. President, I would like to state with reference to the object of this paper that I have not tried to prove that Drs. Shurly and Gibbes have done a great thing for the world, for even they do not claim anything of the sort. I do not think a great deal has been accomplished, but I think the treatment worth trying, and certain cases will be benefited by it. In what Drs. Shurly and Gibbes said when they were here there was no description of the treatment and I have not seen any in print. I have therefore endeavored to describe the method so fully that physicians may try it if they wish. I believe that it is well worth a trial.

Professor Fenger objects to the statements made by Drs. Shurly and Gibbes, that these injections have rendered animals immune to tuberculosis; stating that there have not been sufficiently detailed statements of their experiments. I am not well acquainted with Professor Gibbes, but I know Dr. Shurly well, and I assure you he is a man whose veracity cannot be questioned. He told me something of the experiments that Drs. Fenger and Goldspohn wished to know more about, but I regret that I cannot tell just how many experiments have been made. In demonstrating what he believed to be the inaccuracy of those who believe that the bacillus tuberculosis is the cause of consumption, Professor Gibbes spoke of having made a thousand mountings from one lung, therefore we may conclude that he has been careful in other experiments. Only one sentence gives me any idea of the number of guinea pigs used in these experiments. I heard some one asking Dr. Shurly about making a certain experiment on guinea pigs and he replied "That it would require fifty-six pigs and several weeks to do it." If each of these experiments has required fifty-six pigs they have certainly not based their conclusions on guesses. This much I know with reference to their experiments on animals; guinea pigs or monkeys have been inoculated with tubercular material, either by injection, or by inhalation of dried tubercular sputum. Half of these animals were given the chloride of gold and soda or iodine, and the other half left without treatment, all other conditions being the same. In an average of about three weeks the animals that were not treated all died, and this has been the case over and over again,

whereas the animals that received the injections of gold and soda, or iodine, lived on and were perfectly well at the end of several months; and those that were killed showed no evidence of tuberculosis. These experiments, it seems to me, are scientific; and I think the objection not well taken. It was urged by one speaker that there is nothing novel in the remedies employed. No novelty is claimed; however, we cannot forget that the hypodermic use of a remedy sometimes produces a very different result from its administration in other ways. Various animal poisons, or Koch's lymph, taken into the stomach cause no injury whatever; but if a small portion enters the blood current profound impressions speedily result. The assertion that it is useless to inject iodine under the skin to destroy certain poisons is, I think, a mistake, as was shown many years ago by Professor Brainard's numerous experiments with the venom of serpents. He caused these to bite pigeons and other small animals and then injected into the wounds certain inorganic agents with antidotal effect; he could thus prevent death almost uniformly by certain drugs, of which iodine was the most important.

Professors Shurly and Gibbes believe that it is not the bacillus but certain ptomaines, or animal poisons, that causes this disease, and if they are right iodine, as shown by the experiments just mentioned, is just the remedy required. Professor Fenger very properly asks for more detailed statements and I have no doubt they will be given eventually; but if he were as well acquainted with Professor Shurly as I am, he would not for a moment question any of the statements he has made. Dr. Fenger's objection to Dr. Shurly thanking the physicians here for their courtesy I think is not well taken, for Dr. Shurly in no way intimates that it was an indorsement of his theory. He thought the physicians here treated him courteously and he quite properly thanked them for it.

In the discussion one of the gentlemen said the inhalations were given with steam and that perhaps it was the beneficial agent.

The inhalations are sometimes given with steam, but usually the spray is formed by compressed air. In answer to Dr. Murphy's question, I may say that the cases reported to-night have not been classified by microscopic examination. In some of them bacilli have been found, in others they have not been

looked for. In some cases where bacilli have been found the patients have been greatly benefited. The remark was made that there was no statement in the report as to the nature of the cases. I think the doctor misunderstood the paper. In these cases the symptoms and physical signs have been recorded with such precision that there can be no question as to the diagnosis. When localized dullness and subcrepitant rales are found at the apex of the lung together with night sweats, emaciation, rapid pulse, hectic, and a history of hæmoptysis it is of little importance whether we find bacilli or not; for such symptoms and signs are not present in simple catarrhal inflammation once in a hundred times.

Dr. Angear referred to voices echoing in his ears that had spoken of cures, *always cures*, from various other remedies. This is all right, but mine was not one of those voices and I do not claim that all of these cases were cured. Out of nearly fifty cases I would not pretend to say that more than three have yet been cured, and it is certainly not extravagant to claim a cure of six per cent., in a disease where probably twenty-five per cent. of all cases eventually get well.

Dr. Patton seconds my remarks in asking that the treatment be given a trial. Anything that will prolong the life of one of these patients is worthy a trial, and I fully agree with Dr. Patton that it is not unscientific to try these things even if we have not begun at the bottom and found the origin of the disease.

As to laryngeal complications, I will state that a number of these have had laryngeal tuberculosis, but I have not seen the laryngeal ulcers distinctly cured by this method. In one of the cases that has greatly improved there was much swelling and soreness but no ulcers; but the pulmonary signs were such that no one in this hall could have doubted the diagnosis. In another of the cases reported, but not certainly tubercular, there was a great deal of laryngeal thickening which had been present for a long time, and the patient suffered from a terrible cough which had resisted all other forms of treatment for months. He was cured in a few weeks.

I suggested to Dr. Rhodes to report only a few typical cases which had been benefited by this treatment, merely to encourage the profession to try the method and not as an effort to prove that it is all that we could wish.



