

Ford (W.H.)

Compliments of the Author.

A CASE
OF
URINARY SUPPRESSION
IN
YELLOW FEVER;

Treated by Super-Oxygenated Air and Jaborandi.

BY
W. HUTSON FORD, M. D.,
OF ST. LOUIS.



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As I have ventured to suggest a trial of super-oxygenated air in yellow fever, in the last number of this JOURNAL, it became me at once to do what I had recommended. I have, accordingly, lost no time in so doing, and I hereto append the results of my experience, limited necessarily to one case, from lack of time and opportunity, though I hope to give the matter a further trial very soon. Having expressed to the Health Commissioner of St. Louis, Mr. C. W. Francis, my desire to try the use of oxygenated air in yellow fever as soon as possible, he very kindly authorized me to have the necessary appliances prepared, and gave me full authority to institute the treatment at the quarantine station, fifteen miles below this city, as all the cases developed here, in persons coming from abroad, as well as those found on vessels coming up the river, are placed there for treatment. Taking advantage of Mr. Francis' enlightened courtesy, I at once had the apparatus constructed, the oxygen prepared,

and on the 29th of August made a trial of it as detailed in the accompanying notes.

The apparatus employed consisted of a gasometer holding twelve cubic feet, with an attached scale graduated into cubic feet and fifths of a cubic foot. I preferred to use a gasometer instead of a rubber bag, because, while costing scarcely more, its use dispenses with a bellows of known capacity for inflating the rubber sac, and because it is altogether more exact, takes up less space, is perfectly noiseless in action, and may be so adjusted by the weights as to rarefy or condense its contained air, within certain limits, or to hang upon an exact counterpoise, if preferred, this latter being the condition in which I used it. The patient breathes through a pipe leading into the interior, which constantly enlarges from the mouth piece to its inner extremity, which was one and one-half inches. The inhaler was such as is used by dentists for giving nitrous-oxide, and is so constructed that the air is drawn from the gasometer, but is prevented from passing back again through the same pipe by valvular contrivances. The respiring tube was nearly three-quarters of an inch in diameter; it *ought* to be fully one inch in the clear, inside, but I could not procure such a one without delay. The oxygen was prepared by Siegel & Bobb, and purified by passing through caustic potassa. I had the ordinary mouth piece reamed out to as large a size as possible, and this was simply inserted into the mouth of the patient, a trumpet-like cone of metal pressing over the lips and angles of the mouth. A little strip of rubber-plaster compressed the nares, which might also be done by a spring clip, so that the patient might sleep while he inhales, which indeed my patient, as reported below, often did.

The plaster or clip is taken off when the inhalation has been conducted long enough, and reapplied when he is to inhale again. The mechanical appliances were perfect, and no necessity was found for the use of any kind of cup designed to include both nose and mouth in one common receptacle; in fact none such that I examined, or could find, would answer, although such a one is in use in connection with the apparatus now employed for the inhalation of compressed or rarefied air by specialists for throat diseases. The gasometer and appliances were executed for me by Messrs. Higgins & Kelleher, in this city.

AUG. 29th, 1878.—Mr. A. W., born in Lexington, Ky., æt.

45; has lived in Memphis 35 years; has been acting as a volunteer nurse to the sick there. Left Memphis by the John B. Maud, on Sunday, 25th inst. On the evening of the 24th inst., had chilly sensations and great pains in the back; took a salt and water emetic, which caused active vomiting and much sweating, and went to bed. The following morning he took twelve grains of calomel which operated very freely. The first day on the river, feeling very hot, he had gone to the guard of the boat and sat in the wind for fifteen minutes; he had high fever at this time, viz., on the 26th inst. He thinks this imprudence chilled him, and he felt much worse afterwards. Came up as a cabin passenger. On the 27th he was stopped at Quarantine. The fever continued high and the bowels were frequently moved every day, by copious stools. On the night of the 28th he felt much weaker, and the pains in the back and head became so intolerable that next morning, (29th) about 10 A. M., a hypodermic injection of *morphine* was given him, after which he became less restless, his backache disappearing, but not the headache.

It was at this stage, viz., on the fifth day of his disease, that I first saw him, at 7.40 P. M. He is now very restless; great irritability of stomach; well-marked hiccough; vomits occasionally without bringing up anything; eyes very much suffused and injected, and conjunctivæ quite yellow; skin perfectly dry and dusky; respirations shallow, 20; pulse 68; temperature $101\frac{1}{4}^{\circ}$ F. He has not passed any urine for some hours. (Suppression.)

8 P. M.—Took thirty drops of Squibb's fluid extract jaborandi.

9 P. M.—Took thirty drops more of jaborandi.

9:30 P. M.—Began to inhale oxygenated air, in the proportion of 30 per cent. of oxygen, including the oxygen naturally contained in air; begins to sweat.

10 P. M.—He is sweating profusely; after thirty minutes inhalation of the oxygenated air, he stops taking it; *pulse*, 80° ; temperature, $100\frac{1}{4}^{\circ}$; says he feels much less restless and anxious; has respired six cubic feet of the mixture.

10:40 P. M.—Vomits; moans; has not passed any urine.

10:50 P. M.—Respires two cubic feet of mixture.

11:30 P. M.—Jaborandi, gtt. xxx.

12 M.—Has been asleep; is much more comfortable; heaves a deep breath occasionally; there is much thirst and considerable irritability of stomach; he now vomits with very great straining.

AUGUST 30TH, 12:10 A. M.—Breathes oxygen for ten minutes.

12:30 A. M.—Sweating profusely; says the saliva accumulates in his mouth faster than he can spit it out; this is the sialagogue effect of the jaborandi; wished to sleep.

1:5 A. M.—He is asleep, but moans occasionally; soon afterwards sleeps profoundly and snores; wakes up and spits from time to time.

2 A. M.—He sleeps quietly and profoundly for fifty-five minutes; his shirt is soaked with perspiration; *temperature*, 99.5°; pulse, 76; respire a 50 per cent. mixture for fifteen minutes. The ptyalism of the jaborandi is declining; after five minutes inhalation, says he feels more comfortable, less oppressed; drops off to sleep.

2:40 A. M.—Wakes and moans; inhalation for ten minutes; soon after gets up and has a small fetid action; has not passed a drop of urine since twelve o'clock on the 29th.

3 A. M.—Asleep twenty minutes later; inhales the 50 per cent. mixture for ten minutes.

3:40 A. M.—NOTE—The effect of the jaborandi has lasted for about four hours, and is now passing off; he takes thirty drops more; this makes four doses, altogether one hundred and twenty drops that have been taken; just before taking this dose, he had a heavy fit of vomiting without ejecting anything but glairy matters.

4:10 A. M.—Respires for ten minutes.

4:30 A. M.—Respires the mixture continuously for one hour and *sleeps quietly and deeply for an hour afterwards.*

At 8 A. M. and 9 A. M. respire for fifteen minutes, from a 60 per cent. mixture; takes a full dose of castor oil at 9 A. M.

10 A. M.—Inhaled for fifteen minutes; ordered two grains of calomel to be dropped on his tongue every two hours.

The patient says he feels better to day than he did yesterday afternoon. The tongue is moist, but he has not passed a drop of urine. Since daylight, he has not moaned, nor vomited at all; says he has no sickness at the stomach; no pain or tenderness at the epigastrium; *no headache*; every hour he inhales the 60 per cent mixture for fifteen minutes, falling off into a quiet nap after each inhalation.

12:30 A. M.—Has been to stool and passed some mucoid matters with much straining—while at stool *he passed, into a sep-*

urate receptacle, some dozen drops of highly colored urine, loaded with bile and albumen.

On being questioned, he says he does not feel as restless to-day as he did yesterday; drinks a good deal of water in quantities of an ounce or two at a time without nausea; he has not vomited since 3:40 this morning; says his eyes do not feel so full and heavy as they did yesterday; has no headache. He holds the inhaler himself; inhales every half hour or so for five minutes at a time and drops off to sleep; he is perfectly rational and composed; the conjunctivæ are very yellow.

2:20 P. M.—Gagged a little, but drank water just afterwards without vomiting it.

3 P. M.—Having been up with him all night, I was relieved for a couple of hours, leaving him in charge of an assistant. He continued the inhalations until 5 P. M., but as he had not passed his water, it was thought advisable by the physician in charge of Quarantine, (a gentleman of no experience in yellow fever), to pass a catheter. No urine flowing, the patient became greatly alarmed, and refused to take the oxygen any longer. Passing the catheter under such circumstances is quite inadvisable, as the mere fact of anuria is significant enough of the suppression, and the procedure always excites, irritates and uselessly alarms an intelligent patient when no urine is found. Being quite satisfied that the introduction of the catheter would have been both fruitless and inadvisable, I had carefully refrained from passing it, and it was done without consulting me, though I was within reach near by, and entirely in opposition to my intentions. As, however, he now refused to respire the oxygen any longer, and as I had no right coerce him, and as the physician in charge, moreover *informed* me that he was not at liberty to do so, it was impossible to continue the treatment further, excepting to order a hot hip-bath, and a diuretic mixture of acet. potass., sp. æth. nitros., and tinct. scillæ every hour and the cautious use of jaborandi. The inhalations during the last two hours, viz.: up to 5 P. M., were from a mixture containing 80 per cent. of oxygen; during this period he took a cubic foot of the mixture at a time, in the space of five minutes, inhaling as strongly and as deeply, without any extra effort, as I had previously found I could do myself upon the same apparatus. My treatment having been interrupted, I left him at 7:30 P. M., although I should thenceforth have given the oxygen *pro re nata*,

as the man was greatly better. His condition, excepting as regards considerable anxiety for himself, was in all respects good. There was no drowsiness whatever; his intelligence was perfect; his temperature was 98.4° ; pulse, 70; said he had no headache at all; had no nausea whatever, and while I asked him these final questions, drank half a goblet of ice water which I brought him myself, and retained it without any sensation of fullness or nausea.

REMARKS—I began with doses of air containing 30 per cent. of oxygen, and finally used doses containing as much as 80 per cent., of course always counting in the oxygen naturally contained in the air. In future I shall certainly reverse this, beginning with the stronger doses and probably weakening them as the treatment progresses. In virtue of the universal passive congestion, the lungs being very full of blood, the quantity of air taken in at each respiration is notably less than the amount which is normally respirable by the same individual as simple "*tidal air*." Indeed, by watching the gasometer, I could plainly see that the patient's inspirations were not one third as deep, on an average when he first inhaled, as they were towards the close of the treatment. As it is designed to supply the oxygen promptly, it would therefore be advisable to use strong mixtures at first, or even undiluted oxygen, and thus to bring the patient more quickly under its influence.

As far as I can judge from this case, the inhalations ought to be practiced every hour, and should last from five to ten or fifteen minutes. At first, the patient should respire the strong mixture, say of 80 per cent., or pure oxygen, for at least half an hour at a time, with half-hour intervals.

The disappearance of the headache, the declension of the temperature, elevation of the rate of heart beat, the disappearance of the nausea and vomiting, the clearing of the intellectual faculties, were effects directly traceable, in my opinion, to the equalization of the circulation, which it was the object of the oxygen to induce. That it did all this I cannot doubt, and I believe that the good effects of the treatment would have been much prompter, had stronger doses of oxygen been given in the beginning. The sweating and sedation of the $\sqrt[3]{}$ jaborandi, no doubt likewise caused the declension of temperature in part.

The patient was seen only late on the evening of the fifth

day. His skin was dusky, and there was universal external and internal passive congestion. Of such a congestion of the kidneys, the albuminuria and the suppression were direct proofs. This suppression, as well as the general congestion, were notably precipitated or exalted, in my opinion, by the unfortunate dose of morphine injected under the skin, in an effort to calm the restlessness, moaning, and nausea, which are only symptoms indicative of the prostration consequent at once upon the non-arterialization of the blood, and its sluggish circulation through the nerve centres and viscera. Not only did the morphine in this case apparently precipitate the suppression of urine, but it so benumbed the nervous system as to render the equalization of the circulation far more difficult to effect than it might otherwise have been.

The jaborandi was given to induce copious sweating, which it did very rapidly and most effectively. My object in using the drug, was to avert danger by uræmic poisoning, by withdrawing the toxic elements of the suppressed renal excretion as well as the bile, by way of the skin. I have found jaborandi capable of averting uræmic intoxication in those forms of latent nephritis which supervene insidiously upon chronic cystitis, and usually destroy the patient. The biliary salts contained in the blood have very probably much to do with that progressive destruction of blood-corpuscles, in yellow fever, in virtue of which an irremediable congestion and asphyxia of the tissues and viscera sets in as soon as the yellow hue is distinctly observable in the conjunctiva, which is always in this disease, coincident with cutaneous duskiness, increase of nausea, black vomit, and suppression of urine. (See an article on the action of the biliary salts on the blood-corpuscles, in the September number of the *Lancet*, 1876.) The jaborandi produced, in this case, considerable depression, marked by sensitiveness to cold, and some shivery sensations. The inhalation of oxygen *rectified these disturbances* almost within a few inspirations, by acting as a powerful diffusible stimulant. The patient took no alcohol in any form, nor anything whatever except what has been noted.

I shall use the method in another case as soon as I shall have an opportunity of doing so without danger of interruption, and shall report my result in this journal. The patient lived until the evening of the 2nd of September, seventy-two hours after I left him; no more oxygen was administered to him, and the case

was one, when I first saw it, of necessarily fatal prognosis. Jaborandi has never before been used in yellow fever, to my knowledge; I have found its action prompt, and I think it will prove highly serviceable in conjunction with other remedies, in the earlier stages of the malady, and with oxygenated air when the congestion is marked, though its depressing influence late in the disease is to be guarded against. Unfortunately, for this purpose, alcoholic stimulants cannot be employed at this stage, and we must have recourse to other kinds of stimulation. Nothing seems to me to promise so well as the continued inhalation of oxygenated air until the secretions are re-established, and the disposition to general and local congestion has passed away.

No one can possibly appreciate the *essential toxic element* in yellow fever, which it is assumed by many must be necessarily fatal, more thoroughly than I do myself; but I am bound to affirm that *no amount of human foresight, sagacity, or practicable expenditure of money will ever prevent the outbreak and propagation of this frightful disease* under certain conditions, and the *only hope* left for our race, is by experimental science and pathological study, to learn how to *cure* the disease.

1611 WASHINGTON AVE, Sep. 4, 1878.
