

turned to a dark, coppery-red colour. Next day it became darker, and three days later scaly patches appeared. In this case one was able to follow the course of the pellagra from the red congested area to the final stage of dark scaly patches with circumscribed areas.

#### Discussion

During the course of investigation of beri-beri in this district, I was surprised not to find any pellagra, a disease closely simulating beri-beri in its aetiology; both are vitamin-deficiency diseases. Although I was on the lookout for the disease I was only able to spot the four cases mentioned above, during the course of the last four years. The last case was accidentally spotted by me in the out-patient department, being treated as a case of indigestion and a condition of the skin. No doubt can exist as to diagnosis of the four cases described above. Case 1 illustrates the nervous complications arising in the course of pellagra. Case 2 has given us the full opportunity of studying the pathology and morbid anatomy of the disease. From cases 3 and 4, one was able to study the clinical aspect of the disease and the effect of vitamin B administration. Case 4 cannot be fully explained; the administration of the pellagra-preventing factor, though it produced rapid amelioration of symptoms, did not prevent the recurrence of the disease. In this case, evidence is produced against the theory that maize is the causative agent in the production of pellagra, since the patient has never taken maize at any time.

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#### REFERENCE

Lowe, J. (1931). *Indian Med. Gaz.*, Vol. LXVI, p. 491.

### ON THE INCIDENCE OF ARSENICAL DERMATITIS\*

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THE report covers a period of six years from 1927 to 1932, during which the total number of injections made was 3,914; during this period there were 15 cases of exfoliative dermatitis that could be attributed to arsenic injections. Novarsenobillon, sulfarsenol and thiosarmine were used; the number of cases treated with novarsenobillon was 449, with sulfarsenol 74, and with thiosarmine 50, and the respective number of injections given of each was 3,530, 468, and 600.

It is interesting to note that dermatitis occurred only in cases treated with the first-named drug.

From the above it will be seen that the cases in which the dermatitis occurred were few and

far between. If the incidence of dermatitis be so rare in hospital practice it must be more rare in private practice and there may be instances in which a general practitioner hardly comes across a case of arsenical dermatitis in his practice. It will, therefore, be worth while describing briefly the chief characters of the cutaneous affections that may occur under arsenical treatment.

Urticaria is common; it may appear during or immediately after injection, but generally disappears within a few hours. Some patients complain of itching of some particular part of the body after each injection and this itching may be a symptom of intolerance. In some cases after a number of injections have been made erythema may appear, the rash of which sometimes remains patchy and resembles seborrhœic eczema. Hyperkeratosis of the palmar and plantar surfaces and atrophy of the nails, toxic alopecia of the areata type, herpes zoster due to inflammation of posterior root ganglia, and herpes simplex involving the vulva and lips, will occasionally occur. Acne-vulgaris boils and carbuncles are aggravated by arsenic or may appear for the first time under the influence of the drug, and there is occasionally a focal reaction at the site of an old chancre.

The most distressing condition, however, is exfoliative dermatitis. The eruptions appear on the inner aspect of the arms, forearms, thighs, lower part of abdomen, as well as on the face, and in bad cases may extend over the whole body within 72 hours. The first appearance is like a measles rash with severe itching, which is at first limited to certain areas but rapidly extends all over the body, becomes confluent, and in a few days forms into vesicles and pustules. The whole body is swollen, the face cedematous and disfigured, the eyes cannot be opened and there may be conjunctivitis. This first stage is called the dry stage. In this stage there is intense itching all over the body. There is a rise of temperature, usually throughout the disease, both in the dry and the weeping stages. After a week or so the weeping stage begins when the vesicles and pustules are ruptured and discharging ulcers are formed. In the worst cases the cuticle comes off like a glove from the hands and feet. There is severe burning pain all over the body, and the patients want to dip the whole body into water. After the separation of the cuticle, the cutis vera is exposed and in places ulcers form and extend deep down to the muscle. Septic complications may start, leading to multiple boils all over the body, or cellulitis. The patient often becomes extremely prostrated, bed-sores form, and toxæmia, broncho-pneumonia or intestinal hæmorrhage are not uncommon terminal conditions.

Recovery is always slow and convalescence protracted. One peculiarity of arsenic poisoning is that if one organ is involved to a serious extent, the other vital organs are generally

\* Rearranged by Editor.

spared. In extensive exfoliative dermatitis, the liver and kidneys may be spared, and in cases in which the liver is badly involved, the kidneys and heart may escape altogether.

The following table gives the incidence of dermatitis, year by year.

Year	NOVARSENOBILLON				SULFARSENOL AND THIOSARMIN		
	Number of cases	Number of injections	Incidence of dermatitis	Percentage of dermatitis	Number of cases	Number of injections	Incidence of dermatitis
1927	104	770	4	3.84	2	24	Nil
1928	103	824	4	3.88	6	48	"
1929	90	720	2	2.22	12	72	"
1930	65	520	3	4.61	10	60	"
1931	62	496	2	3.23	30	180	"
1932	25	200	Nil	Nil	64	684	"
<b>TOTAL</b>	<b>449</b>	<b>3,530</b>	<b>15</b>	<b>..</b>	<b>124</b>	<b>1,068</b>	<b>Nil</b>

The following table gives the time of appearance of the dermatitis in relation to the number of doses and the total dose of the arsenical given.

Number of cases	Number of injections prior to onset	Total dose prior to onset in grammes
1	1	0.3
6	3	0.9
6	4	1.2
1	6	2.1
1	7	2.55

All our patients being women they get the first four injections of 0.3 gm. each and the next four injections of 0.45 gm. each, making a total of 3 grammes. They also get a course of bismuth or mercury injections along with the arsenic treatment.

From the above it is evident that the arsenical dermatitis may be due to natural hypersensitiveness to arsenic, as in one of these cases it occurred after one injection only. Undoubtedly in the majority of cases the skin lesions are due to the cumulative toxic effects and these are due to injury to the important organs concerned, namely the liver and kidneys, by the chronic pathological changes caused by the *Spirochæta pallida* in some cases, by bacterial or other diseases in others, and by the administration of mercury in probably not a few. In two cases of our series in which mercury (4 c.cm. of mercurisol) was injected along with the arsenic, a very severe form of dermatitis appeared after the injection; both of these patients had albuminuria.

On the night before the injection the patients were given a light diet, they were allowed no food in the morning prior to the injection and for the rest of the day they were given only

barley water and milk. A dose of glucose was given with alkali an hour before the injection to protect the liver cells. A saline purge was given the previous night and again on the following morning to help excretion of arsenic. Patients were kept in bed on the day of the

injection. In cases of accidental extravasation of novarsenobillon solution into the subcutaneous tissues, we have got very good results by immediately injecting sodium thiosulphate solution subcutaneously in the infiltrated zone. This immediately lessens the local irritation, the patient is relieved of the extreme pain, and after-effects are obviated.

In 1932 at the suggestion of Lieut.-Colonel Denham-White, 3 c.cm. of 10 per cent. sodium thiosulphate solution was injected after the fourth dose of novarsenobillon in 25 cases; in none of these cases has dermatitis occurred.

*Treatment for dermatitis.*—The usual treatment was followed; patients were put to bed and kept at absolute rest; liquid carbohydrate diet, such as barley water and glucose, and milk were given; protein and fat were restricted; calamine lotion was applied externally in the dry stage to allay itching; an alkaline mixture containing potassium citrate, potassium bicarbonate, and urotropine was given orally several times a day; saline purgatives were given daily to help the excretion of the arsenic; ichthyol, grains ii, in pill form, was given twice a day; and 10 per cent sodium thiosulphate solution was given intravenously or intramuscularly every alternate day or every day up to 4 c.cm. at a time, for five or six injections, or until the progress of the disease was checked. In the weeping stage ichthyol in arachis oil was applied externally over the cracked and painful areas. In prostrated conditions stimulants were administered, the patient was protected from cold, and the ulcers kept clean. After recovery no further arsenic treatment was given for at least a year.

Some illustrating case notes are appended below:—

(1) K., Hindu female, aged 30 years, admitted on 27th October, 1930. Wassermann reaction strongly positive. She was treated with novarsenobillon and

mercurosol, alternately. After the third injection the reactionary fever had persisted for three days, instead of subsiding within 24 hours as usually happens. When the next dose of one c.cm. mercurosol was injected the temperature rose again for one day. This temperature started with a rigor and was thought to be malaria, but no parasites were detected on blood examination. Two weeks after the third injection the fourth dose of novarsenobillon was given intravenously; two days later an itching erythematous rash appeared on the chest and thighs, there was swelling of the face, and pain all over the body. After ten days pustules started to develop at the roots of hairs and there was a slight rise of temperature. The skin began to scale off leaving discharging ulcers.

The dermatitis persisted for one month during which time five injections of thiosulphate were given. The itching sensation continued for a month more.

(2) S., Hindu female, aged 23 years, admitted on 12th June, 1931. Wassermann reaction strongly positive. She was treated with novarsenobillon and bismostab, given alternately. Seven days after the third injection of novarsenobillon (0.3 gramme) she developed intense itching; sodium thiosulphate was immediately injected intravenously. The itching disappeared and novarsenobillon was resumed after two weeks, but each injection was preceded by an injection of sodium thiosulphate. Bismostab was also continued. She had five more injections of novarsenobillon, one of 0.3 gramme and four of 0.45 gramme, each preceded by sodium thiosulphate; she developed no further symptoms of intolerance. She was discharged cured on 4th October, 1931, with Wassermann reaction negative.

(3) G., Hindu female, aged 25 years, admitted on 9th March, 1931. Wassermann reaction negative at first, but after a provocative injection of novarsenobillon of 0.3 gramme it was moderately positive. She was then treated with novarsenobillon and mercurosol, 1 c.cm., alternately. She was given four injections of 0.3 gramme novarsenobillon and one of 0.45 gramme. After the fifth injection of novarsenobillon she continued to have a daily rise of temperature; this ranged from 100° to 103°F. On the third day dermatitis appeared over the face, axillæ, forearms and thighs. The urine was free from albumen, though scanty in amount; the motions were loose. Her face was swollen so much that she could not open her eyes, and she had conjunctivitis. Her skin came off in flakes leaving profusely discharging ulcers. She then developed multiple boils all over the body, bed-sores on her back, buttock, and heels, and her condition was precarious.

The usual treatment was given; she received six injections of sodium thiosulphate of 2 c.cm. each, intramuscularly, as the bend of the elbow was involved in dermatitis intravenous injection was not possible. Her condition became very bad and she was given brandy, digitalis, and strychnine. She recovered, and was discharged cured after eight weeks.

#### A PLEA FOR COLLAPSE THERAPY IN THE EARLY STAGES OF PULMONARY TUBERCULOSIS\*

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THE medical profession in this country has been slow to take advantage of one of the most important recent advances in the treatment of

pulmonary tuberculosis. Doctors are liable to rely too much on remedies such as creosote, cod-liver oil, calcium and the various gold preparations, and, without considering sufficiently the economic aspect, to advise their patients to go away for a change of air or to a sanatorium. The fundamental measure in the treatment of tuberculosis should be rest of the affected part; other methods can then be employed to raise the resistance of the body as a whole against the infection. The only way that the lung can be given rest is by causing collapse of the whole or part of the lung. The best results are obtained in early cases of tuberculosis, and therefore our aim should be the early diagnosis of the lesions and the adoption of collapse therapy without delay.

The methods by which this form of treatment can be applied are artificial pneumothorax, phrenicotomy and phrenic evulsion, apicolysis (i.e., paraffin compression), and thoracoplasty. Of these the first mentioned is the simplest and can be performed by the average practitioner in any hospital or dispensary.

Phrenic evulsion is also a simple operation and can be undertaken under a local anæsthetic; it is very often a useful adjunct to the pneumothorax treatment, especially in cases in which there are basal lesions with adhesions, but it is also adopted as an independent form of treatment. Phrenic evulsion causes paralysis of the diaphragm on one side, with the subsequent limiting of the movements of the lung.

Apicolysis, the name given to the operation of injecting paraffin to cause collapse of the apex of the lung, and thoracoplasty are both more formidable operations which should only be undertaken by experienced surgeons in well-equipped hospitals.

*Indications for artificial pneumothorax.*—It has been said that pneumothorax therapy is not necessary in early cases when the disease is still curable by sanatorium and other methods of treatment, but the condition is seldom diagnosed at this stage in this country. On the other hand no case is too advanced, provided it is one-sided and there are no adhesions which would prevent the compression of the lung. The essential factor is the softness of the lung which can be judged by clinical and x-ray examinations. There is no reason why a bilateral operation should not be done as long as there is healthy lung tissue sufficient for respiratory exchange.

Any early active case of pulmonary tuberculosis, either with one or both lungs affected, is suitable for this line of treatment. The persistence of any of the following symptoms and signs is an indication of 'activity':—rise of temperature, hæmoptysis, loss of weight, tubercle bacilli in the sputum, toxæmia, general failing of health and persistent catarrhal signs in the lungs, and persistent pleural effusion. In

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