

where underlying an apparent innocent scalp wound a linear crack is detected some time later by x-ray. Two cases have thus been lost following late septic meningitis. It is difficult to take the view to operate as a routine in all cases of linear fracture, particularly on the inner table accompanied by scalp injury, though on principle one should.

*Convalescence.*—In short it may be said that when the patient has become conscious and remains continuously so he passes into the stage convalescence.

To prevent post-traumatic neurosis, the patient is to be warned of early commencement of activity. All mental strain is to be avoided for a long time and also acts that raise intracranial pressure. Sedatives such as luminal should be continued for a long time.

*Some observations on one hundred consecutive cases of head injuries*

*Age factor.*—Only three cases out of twenty proving fatal were below 5 years of age. This is perhaps explained by the fact that there is more accommodating power in a child's calvarium than in case of an adult. Furthermore

*List showing deaths in relation to time interval following admission*

No.	Sex	Age in years	INTERVAL		Cause of death
			Hours	Days	
1	M.	30	60	..	Laceration of frontal lobe.
2	F.	45	..	11	Septic meningitis with fracture.
3	M.	45	..	11	Rupture of hæmatoma in ventricle.
4	M.	30	36	..	Extensive injury of brain and lung.
5	M.	1½	..	..	Brain protruded.
6	F.	70	..	30	Septic meningitis.
7	F.	2	60	..	Middle meningeal hæmatoma.
8	M.	45	3	..	Gun-shot wound through palate.
9	M.	28	12	..	Intra-ventricular bleeding.
10	M.	20	54	..	Large sub-dural hæmatoma.
11	..	9	20	..	Extensive laceration of brain.
12	M.	30	10	..	Laceration brain.
13	M.	20	..	30	Primary meningococcal meningitis.
14	M.	25	6	..	Extensive injury.
15	M.	4	18	..	Laceration brain. Meningeal hæmatoma. No fracture.
16	M.	35	4	..	Prolapsed brain.
17	F.	75	6	..	Laceration brain. No fracture.
18	F.	2	..	..	Extensive injury.
19	M.	40	..	3	Sub-dural hæmatoma by falx cerebri.
20	M.	30	..	9	Laceration brain.

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## LEPTOSPIRAL JAUNDICE IN ASSAM

By B. M. DAS GUPTA

(From the Department of Protozoology, School of Tropical Medicine, Calcutta)

CONSIDERABLE interest has been aroused by the recent discovery of infectious jaundice in Calcutta (Das Gupta and Chopra, 1937), and since then, material (chiefly blood sera) from cases of jaundice occurring in different parts of India, viz, Bihar, Bikaner, Simla and Deccan, have been received by the writer for examination for evidence of leptospiral infection. The

TABLE I  
Agglutination tests

Strains of <i>Leptospira</i>	TITRE OF AGGLUTINATION			
	20	40	80	160
Strain Chopra, Calcutta (classical <i>Leptospira icterohæmorrhagiae</i> ).	+	+	+	+
<i>L. canicola</i> .. ..	+	+	+	+
Mg. Tin Tin .. ..	+	±	—	—
Andamans A .. ..	—	—	—	—
Andamans B .. ..	—	—	—	—

clinical features in most of these cases were not, however, suggestive of infectious jaundice and

(Continued from previous column)

extensive injuries are by nature commoner in adults.

Fracture of the skull: Out of about eighty-five cases clinically taken to be severe injuries only twenty showed fracture of the skull.

*Lumbar puncture.*—As a diagnostic procedure undoubtedly an important test but as a routine done in the ward it is of less significance (due probably to faulty technique) as a large number of reports show blood-mixed fluid.

It will be noted in the above list that 50 per cent of the deaths occurred within 24 hours of injury and another 25 per cent within 60 hours, that is 75 per cent died within three days of the injury. These deaths are always due to extensive injury to the intracranial contents and are obviously beyond treatment.

The cases of sub-dural hæmatoma might have been saved by early operation.

Three cases developed septic meningitis after 10 and 20 days. The third one is interesting in that he developed primary meningococcal meningitis with an uncomplicated head injury.

I take the opportunity of expressing my indebtedness to Dr. D. C. Chakravarty, for giving me all facilities in treating the above cases.

laboratory examination also failed to prove that leptospira was the causal factor. However, quite recently Mr. Watson of the Deamoolie Tea Estate, Assam, sent us a specimen of serum from a patient who was suspected to have been suffering from Weil's disease. The medical officer stated that eight cases of jaundice had come under his observation from June 1940 to July 1941, four having proved fatal. Agglutination tests and protection experiments were carried out with the serum.

TABLE II

Strains	TITRE OF AGGLUTINATION			
	100	1,000	10,000	100,000
<i>L. icterohæmorrhagiæ</i> ..	+	+	+	±
<i>L. canicola</i> ..	+	-	-	-

It is evident from the foregoing tables that the serum is strongly positive, agglutinating the classical *L. icterohæmorrhagiæ* in dilutions up to at least 1 in 10,000 and it also gives some para-specific reaction with *L. canicola* and Mg. Tin. The latter strain was isolated by me from a case in the Andamans and found to be identical with a Java bat strain, 90 C.

#### Protection experiment

0.4 c.cm. of the serum under investigation was injected intraperitoneally into a young guinea-pig and six hours later the animal was inoculated by the same route with 2 c.cm. of virulent culture of the classical *L. icterohæmorrhagiæ*. As a control, another guinea-pig of approximately the same weight, which had received 0.4 c.cm. of normal human serum, was similarly inoculated with the culture. The guinea-pig inoculated with the patient's serum was completely protected, while the control animal developed severe hæmorrhagic jaundice and died. Post-mortem examination showed characteristic lesions and leptospiræ were present in large numbers in the liver and kidney emulsions. It would thus appear that the patient's serum contains sufficient protective antibodies and is homologous with the classical *L. icterohæmorrhagiæ*.

As far as we have been able to ascertain, this appears to be the first authentic case of infectious jaundice yet reported in Assam.

Our thanks are due to Mr. Watson and Dr. Pal of the Deamoolie Tea Estate for sending us the material on which this note is based.

#### REFERENCE

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## A NOTE ON THE OCCURRENCE OF LEPTOSPIROSIS IN BOMBAY

By M. N. LAHIRI

(From the Haffkine Institute, Bombay)

EPIDEMIC and sporadic cases of fever followed by jaundice suggestive of leptospirosis have been reported by workers from time to time in the city of Bombay, but so far none of these was supported by positive bacteriological findings. It has been emphasized that although diagnosis of leptospirosis can be made partly on clinical grounds, it cannot be regarded as completely reliable unless confirmed by laboratory examination. It is, therefore, not unlikely that for the lack of investigation by laboratory methods many cases might have passed unrecognized.

A survey of the literature shows that as early as 1907 Tucker described an outbreak of jaundice in one of the congested areas of Byculla; of the ten cases recorded in the paper nine proved fatal. No bacteriological studies were carried out. Parmanand (1922) studied seven cases of jaundice that came under his observation. The description of the symptoms no doubt conform to that of leptospirosis, but as in no case was the causal organism isolated by culture, the true nature of the disease remained undetermined. Liston (1922) received material from a fatal case in Santa Cruz; no spirochaetes were seen by him, but he did find in liver histological evidence of acute yellow atrophy.

Turkhud (1928) also claims to have seen a small epidemic of jaundice in Bombay due to leptospirosis, but the diagnosis was based entirely on clinical grounds.

More recently, Manohar (1940) studied a few cases of jaundice and also examined autopsy materials. No systematic bacteriological examinations were carried out and the causal organism was not isolated from any of them. Diagnosis was based partly on animal inoculation. Moreover, it is rather difficult to agree with the findings of the author in one case where diagnosis was arrived at by detection of leptospiræ in a sample of stool. Thus, it would appear that the laboratory confirmation is still lacking and it was considered worth while to undertake the bacteriological studies in such cases.

The following is a report of a case of jaundice with fever in which leptospira was isolated and the patient's serum gave evidence of high agglutination titre.

The patient was admitted in the Gocaldas Tejpal Hospital and was brought to my notice by Dr. N. J. Modi, Honorary Physician. The patient was seen on the 11th day of illness suffering from fever, jaundice, headache and intense prostration. The history suggested acute onset with rigors and pain all over the body which made it practically impossible for him to move about in the bed. The examination of urine showed the presence of albumin, casts (both epithelial and granular), leucocytes and a few red blood cells besides bile salts and bile pigments.