

## Two Cases of Umbilical Infection in the Newborn

### Case Reports

Presented by Doctor Tay Kah Seng

#### CASE No. 1

The infant was normally delivered in Kandang Kerbau Hospital. The umbilical cord was ligated and divided and was left exposed. On the 6th day of life, a mild jaundice was noticed. This was followed the next day by a foul discharge from the umbilicus. The infant was treated with penicillin and streptomycin I/M. and the infection cleared up in 2 days. The organisms isolated were staphylococcus aureus cultured from an umbilical swab.

#### CASE No. 2

One of twin pregnancy. The first baby was delivered at home. The 2nd baby was retained in utero for 2 days before admission to hospital where the 2nd twin was delivered following a pitocin drip.

Four days after admission i.e. on the 6th day of life the first infant developed opisthotonos, muscular rigidity and generalised spasms. A diagnosis of Tetanus Neonatorum was made. The treatment given was anti-tetanus serum 100,000 units I/M, 6 hourly. Sedation was achieved by Largactil 6 mgms., I/M. and Paraldehyde  $\frac{1}{2}$  c.c. I/M. alternating with Chloral grains 1 at 3 hourly intervals. The baby was tube fed. The next day the baby was transferred to the General Hospital where he died three days later

### Discussion

Doctor Tay discussed the treatment of tetanus.

In the newborn the site of entry of the tetanus bacillus was an infected umbilicus and was usually due to ignorance and poor hygiene.

Literature on tetanus neonatorum was scanty because this condition, being entirely preventable, was very seldom seen in

England, European countries and America. In adults the incidence of tetanus had also greatly decreased due to the improved standard of hygiene and the introduction of active and passive immunisation.

In Singapore and in underdeveloped countries tetanus neonatorum is far from being a rarity. Many babies die of tetanus without medical care.

Jelliffe of University College, Ibadan (1950) reported 25 cases of tetanus neonatorum in the first six months of one year's statistics that he reviewed. Of these 25 cases, 24 died showing a very high case mortality.

In Singapore 10 cases were admitted into the Paediatric Unit General Hospital in 1956

The tetanus bacilli entered the newborn via the umbilicus. They are anaerobic, spore-bearing and are usually present in dirt, dust and animal manure, and are extremely resistant to heat and drying. They multiply at the site of inoculation forming a very virulent toxin which has a special affinity for the C.N.S. This toxin reaches the C.N.S. by passing up the axis cylinders of the motor nerves or the perineural lymphatics. Once the toxins reach the C.N.S. and combine with the nerve tissues the symptoms of the disease become manifest.

The incubation period was stated to be from 2 to 24 days or even longer. The severity of the disease depended on the number of organisms inoculated, the resultant toxin produced, and the time after infection when the patient was treated. The earlier the manifestation of the disease, the worse the prognosis of the case.

In an infant the first sign was irritability. The baby cries continuously and refuses feeds. Twitching and rigidity of the muscles follows, and results in opisthotonos, abdominal rigidity and spasm of

the respiratory muscles. Risus sardonius is not always seen in the infant. Opisthotonos and rigidity of the abdominal muscles are constant features. The paroxysms of muscular rigidity are induced by any external stimulus. In the adult the patient is conscious and pain is an early feature of the disease. When the incubation period is less than 8 days the prognosis is bad. In the newborn infant the case mortality was 24 out of 25 cases in Jellife's series, and 8 out of 10 of Dr. Smith's cases.

Prophylactic treatment was the ideal as the case mortality even in adult tetanus was very high, and the disease a very distressing one.

*Passive Immunisation* with anti-tetanus serum.

Prophylactic dose in the adult—  
1500 units of A.T.S.

Prophylactic dose in the baby—  
750 units

In the adult the question of the criteria for administration of anti-tetanus serum prophylactically vary from hospital to hospital. The casualty and surgical departments of most hospitals have their own rules for the administration of A.T.S. Some hospitals, especially in North America, give prophylactic doses of A.T.S. in all cases where there has been a breach in the skin in view of the possibility of medico-legal problems arising from the failure to give passive prophylaxis. Doctor Cole states that passive immunisation should be given where there are wounds in which there is a reasonable possibility of tetanus infection.

In the case of infants born outside Kandang Kerbau Hospital and delivered by the mother herself or where non sterile instruments have been used to cut the cord, passive immunisation should be given. The purpose of showing this case was to suggest the use of prophylactic A.T.S. for those babies delivered by a lay person.

Some authorities oppose routine passive immunisation because they say that tetanus anti-serum is not entirely harmless, the worst feared reaction being anaphylactic shock. However, from figures produced by Moynihan (1956) who gave a series of 7580 A.T.S. injections to adults, there were only 2 cases of protein shock, 0.025%. These 2 cases did not result in death.

However, local reactions in the form of rash and swelling at the site of injection amounted to 5% of the above cases.

Moynihan reported that 7 out of his 14 cases of tetanus had received trivial injuries. Had prophylactic A.T.S. been given to these cases, the incidence and the severity of the disease would have been reduced.

**ACTIVE IMMUNISATION:** using tetanus toxoid.

Cole states that if active immunisation with tetanus were carried out to the same extent as Diphtheria, the disease would be eradicated as in the case of diphtheria and small-pox. In England and Wales, the incidence of tetanus is reported to be about 200 cases annually, most of these cases being from trivial injuries which have been over-looked. Cole believes that this loss of life can be reduced by wider use of active immunisation. The value of active immunisation is emphasised by the experience gained during the 2nd World War when both the British and American armies were given compulsory routine active immunisation. Tetanus was completely eliminated under circumstances where there was serious risk of contracting the disease. 2 doses of tetanus toxoid were given at intervals of 6 weeks, followed by a 3rd dose 6 months to 1 year later. This conferred an immunity for 5 years. Active immunisation was becoming recognised as an essential part of childhood immunisation. In France and Denmark, combined Diph-tetanus active immunisation was compulsory for children, and in America and Canada Diphtheria-tetanus-whooping cough active immunisation was widely used. A preparation of D.T.P.P. (Diph-Tetanus-Pertussis Prophylaxis) was available for children. The advantage of combined prophylaxis is the reduction of the number of injections.

#### DOSE FOR CHILDREN:

0.5 c.c. (1 c.c. for adult) of tetanus toxoid intra-muscularly or deep subcutaneously, followed by similar dose 6 weeks later.

A 3rd dose to follow 6-12 months later.

A reinforcing dose every 5 years maintains a satisfactory level of immunity.

Reaction from tetanus toxoid is rare and if present it is very mild.

## ACTIVE TREATMENT:

- (i) High dose of A.T.S.—  
Children 100,000 units I.M.I.
- (ii) Anti-bacterial drugs—  
Penicillin.  
Streptomycin.
- (iii) Anti-convulsants—  
Barbiturates, Chloral Hydrate,  
Paraldehyde.  
Muscle relaxants—  
—d-tubo curare chloride (by I/V  
drip).

For laryngeal spasm and tetanic standstill of respiratory muscles a high tracheotomy under General Anaesthesia preceded by oral intubation, should be done to keep the airway clear and allow secretions to be aspirated.

The patient's mental state was not affected — he was fully conscious of his surroundings — and to relieve this great mental strain continuous anaesthesia can be maintained for several days, by using nitrous oxide 50% and oxygen 50%.

(iv) Largactil has been used.

Doctor Smith reviewed with the house the cases of tetanus neonatorum admitted to the Mistri Wing of the General Hospital in 1956. There were 10 cases. Of these, 6 were self-delivered, two were delivered at home by midwives. In one case the type of delivery was not recorded. One baby had been delivered in Kandang Kerbau Hospital and was a D.A.C. case but in this instance the mother had applied cockroach powder to the umbilicus after discharge.

The incubation period varied from 3 to 14 days. The case mortality was 8 out of 10. The recovery of the 2 survivors was largely attributable to the skill of the nursing staff.

A picture from Jellife's article was shown. The points emphasised were the clenched fists, dorsi-flexion of the feet and plantar-flexion of the toes and rigidity of the abdomen.

Treatment given consisted of 100,000 units of A.T.S. and Penicillin I/M. in all cases. Sedatives — Paraldehyde, Luminal and Chloral were used. Continuous anaesthesia, Curare, Largactil, and tracheotomy had not been used and anaesthesia to render the patient unconscious was not embarked upon, as special nurses would be needed.

Dr. Smith pointed out that the annual 200 cases of tetanus occurring in England and Wales occurred in adults and older children. She had not seen a case of tetanus neonatorum until she came to Singapore. This case was shown to ask the house to consider giving A.T.S. to babies where the cord had been cut with non-sterile instrument. She believed that it is worthwhile giving prophylactic A.T.S. 750 units to these infants.

Active immunisation did not concern Kandang Kerbau Hospital directly. It was not possible to immunise all pregnant women. The public health department was not practising active tetanus immunisation at present because it involved 3 injections instead of 2 and there is a higher incidence of local reactions to triple antigen. These factors would prejudice the mothers against the diphtheria campaign. The general public in Singapore is not ready for active immunisation using this triple antigen, just yet, but it was to be recommended to parents anxious to co-operate.

Doctor Field asked the House if all the members were satisfied with the present method of treating the cord in Kandang Kerbau Hospital and what were the ultimate results of this method.

Doctor Lumsden preferred the old method of covering up the cord. His reasons against the new method were: (1) it took a longer time for the cord to fall off. (2) the cord was moist, often with exuberant granulation tissue. He asked Dr. Field if she had any experience with clips. The cord is said to fall off in a day or two. He asked the House if it would be worthwhile trying this method.

Doctor Manion said that he had seen clips being used in the year before he left for Singapore. This method was gradually gaining popularity in England. The cord dropped in 3 days.

Doctor Field said that it might be worthwhile trying it on a small scale in Kandang Kerbau Hospital. She agreed with Doctor Lumsden that the open method takes a longer time. She herself was not fully satisfied with the present method. She read an article recently where 3 different methods of treating the cord were used. The conclusion reached was that the best method was the one of dressing the cord and treating it with powder.

Doctor Lumsden stated that one point against the old method was that it had been reported that tetanus bacilli had been isolated from some cord powder (said to be Japanese in origin)

Doctor Field agreed with this but added that this could be obviated by using powder of good manufacture and this powder could be distributed to midwives by the Government.

Doctor Smith said that she had known of B. Coli and various other organisms being isolated from the common container of cord powder. She suggested that the various methods of treating the cord may be tried in Kandang Kerbau Hospital—one method for each ward.

Doctors Field and Lumsden were in agreement with this suggestion.

Doctor Field commenting on the appearance of jaundice in umbilical infection asked the House how severe must an infection be to affect the liver and produce jaundice. Was it necessary to have a discharging umbilicus, or could jaundice be produced by a mild infection.

Doctor Smith said that a purulent discharge was not always present. It was known that in babies delivered at home by midwives where umbilical swabs were taken on the 4th day, the organisms isolated included Staphylococcus Aureus, Haemolytic Streptococcus, B. C. D. and B. Coll.

Doctor Field next discussed the problem of jaundice in babies in Singapore which is seen less in other parts of the world. The jaundice in these babies was not of the haemolytic type. It gave rise to kernicterus in the first 16 days of life causing a large number of deaths. She pointed out that in a large number of these cases the babies had umbilical infections. She wondered if this infection could play a part.

Doctor Smith commented that umbilical infections are not limited to Singapore but that this jaundice was much

commoner here than, for example, in Ceylon where the incidence of sepsis must be as high. She further said that although the present method of treating the cord may not be the best, it had the advantage of being quick and simple, and was normally effective.

Doctor Field then went on to discuss tetanus neonatorum. She believed that this disease was absolutely preventable, and much depended on the education of the midwives. She supported Doctor Smith's suggestion of giving A.T.S. prophylactically to all babies not delivered by a midwife. She asked the House of their opinion.

Doctor Lumsden asked if it is true that babies do not get anaphylaxis.

Doctor Field agreed with Doctor Lumsden, saying that babies develop antibodies slowly. She believed that it was a wise step to give A.T.S. to babies born before arrival at hospital and where there was a reasonable likelihood of tetanus infection. She went further and suggested that all self delivered babies should be given A.T.S. when they come for registration. (In the Federation, all babies must be registered within 12 days of birth).

Doctor Smith thought this was not practicable in Singapore, because 6 weeks were allowed for registration.

Doctor Field then spoke on tetanus, saying that once the disease had developed the damage was already done. A.T.S. was of little value. An important feature in the diagnosis, as was pointed out by Doctor Smith, was the abdominal rigidity in contrast to the spastic child where the abdomen was soft. She commented on the new lines of treatment of tetanus with Curare, Largactil, Tracheotomy, Artificial Respiration under prolonged general anaesthesia, which all required specialised technique. She agreed with Doctor Smith that nursing care played a very important part.

The meeting was then closed.

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