Tetanus Following Smallpox Vaccination

Dr. Ajit S. Puri, Patiala (India).

Tetanus is a common disease in India. The usual mode of infection is by contamination of a wound which may be caused by burns, splint, compound fracture, gun shot wound, frost bites, bed sores, nails, pin prick, vene-puncture, eczema etc.

Tetanus following smallpox vaccination is extremely rare one and is of special consideration. Two cases of tetanus following smallpox vaccination who got admission to the Rajindra Hospital, Patiala (affiliated to Govt. Medical College) are being reported.

CASE REPORT:

Case No. 1.

A male child aged one and a half months, Cr. Na 31340 who was brought to this hospital on 23rd May, 1966 with the complaint that the baby had difficulty in opening the mouth for the 1st two days, followed by repeated convulsions of the whole body. The boy used to get typical tonic convulsions every 15-20 minutes. There was absolutely no history of injury since the birth of the baby but on leading questions, the history of smallpox vaccination, following appearance of above symptoms 15 days later, was elicited. On examination, the child was fully conscious lying in opisthotonus position and mild stimulation led the child to exhibit typical tonic convulsions. There was marked trismus and attempt to open aggravated the lock jaw. There was stiffness of the neck, tightness of the chest, rigidity of abdominal wall, back and the limbs. The pulse was 90 per minute, blood pressure 100/60 of millimetre of mercury, temperature 99°F and respiration 20 per minute. Examination of abdomen, chest and cardiovascular system revealed no other abnormality. Nervous system

showed higher centres to be normal. The patient being fully conscious and could cry to some extent inspite of lock-jaw, cranial nerves intact, the tone was markedly increased in all the limbs and the reflexes were brisk with planter flexor. There was no sensory change.

The patient was put on sodium luminal, intramuscular meprobromate, procain penicillin and intragastric feeding. The convulsions stopped on 4th day, and on the 11th day the patient was cured and discharged. The patient was not given any anti-tetanus serum.

Case No. 2

A two years male baby Cr. No. 33894 got admission to this hospital on 29th June, 1956 with the complaint that the child had difficulty in opening the mouth for the last few hours. There was no history of any injury but the parents came out with the history of smallpox vaccination seven days previously.

On examination there was typical lock jaw and rigidity of the whole body. The blood pressure, pulse, temperature and respiration were all normal. Examination of nervous system revealed reflexes to be brisk in all the four limbs with flexor planter response. Examination of other systems showed no abnormality.

The patient was put on sodium luminal, meprobromate, procain penicillin, intragastric feeding. On 3rd day the patient developed aspiration pneumonia which progressed and in about 48 hours the patient expired.

COMMENTS:

Tetanus is caused by contamination of any wound or abrasion of skin or mucous membrane especially bronchial or intestinal mucosa (Boyd 1963), by spores of *Clostridium tetanii* which are abundantly found in the soil. Though tetanus has been described following any type of wound, commonest are the injuries especially during road side accidents from the ground.

Tetanus as a complication of smallpox vaccination, though reported in literature, is extremely rare.

Armstrong (1927) has reported only forty one cases of post vaccinal tetanus between 1904-1914 in the United States of America when thirty one million people were vaccinated. Similarly Acland (1956) reported one case in more than five million vaccinations in England. Rarity of this complication is very well described by Price (1956), Wilson (1955) Wagren (1962). Recently Laha et al (1965) studied 1,000 cases of tetanus but none of their cases followed smallpox vaccination.

Contamination of smallpox wound may be due to unhealthy skin, improper sterilisation of rotary lancet, infected lymph or the dust falling on the wounds while the child is playing. As the cases are usually isolated ones, so the possibility of infected lymph or improper sterilisation of rotary lancet could be excluded with certainty as many cases are vaccinated at a time. Moreover, prolonged research by many workers using a variety of methods, has failed to demonstrate *Cl. tetani* in commercial vaccine virus or in other vaccination material (Maxey 1956).

Hence the probable cause in these cases could be contamination from unhealthy skin or from the dust. This raises a problem as if strong antiseptics be used on the skin before vaccination or not. Antiseptics are likely to prevent the virus from multiplication and hence may result in unsuccessful vaccination. Recently smallpox workers conference in India (1964) has reported that a wet swab followed by the use of a dry swab be practised for the cleaning of vaccination site. Chemical agent such as spirit did not find favour. The present practice of using soap and water did not find acceptance.

Contamination of wound with dust may be contributory factor. Sterile loose dressing may be used (Wagner 1962) while Armstrong (1927) reported 41 cases of tetanus during 1904-1914 when thirty one million lymph doses were inoculated in the United States of America, and it occurred in only those cases in which a protective shield or dressing strapped to the arm has been applied. Again in 1929, Armstrong demonstrated 116 cases of tetanus following smallpox vaccination and in all cases, vaccination site was covered by some dressing or the other. He claimed that vaccination insertions treated openly have never been followed by tetanus. He proved experimentally that dressing at the vaccinated site affected conditions favourable to the growth of tetanus bacilli, accidentally introduced from extraneous sources.

In the present cases vaccination wound was not covered and hence it became interesting to report two cases of post vaccinal tetanus in about a month. It is worth noting that tetanus is more common in illiterate people and the one who reside in villages of poor hygienic conditions. It is all possible that children playing in the dust get themselves infected at the vaccinated site and so develop tetanus.

The ideal way of proving tetanus occurring, after smallpox vaccination should have been isolation of spores in smallpox wounds. This was not attempted in the above cases as the cases presented classical picture and there was no evidence of any other injury to the skin except smallpox wounds. The possibility of post vaccinal encephalomyelitis which is a common occurrence after smallpox vaccination was also excluded by the fact that child being conscious while getting typical tonic convulsions coming on stimulation and there was no other neurological deficit.

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