Tetanus toxoids and wound management

Tetanus toxoid and antitoxin preparations

- Tetanus and diphtheria toxoids adsorbed (Td).
- Tetanus immune globulin (TIG).
- Diphtheria and tetanus toxoids and pertussis vaccine adsorbed (DTP).
- Diphtheria and tetanus toxoids adsorbed (DT) (dose of diphtheria toxoid is higher than that in Td; dose of tetanus toxoid is the same).
- Tetanus toxoid adsorbed (T).

All adults lacking a complete primary series of diphtheria and tetanus toxoids should complete the series with Td. A primary series for adults is three doses of preparations containing tetanus and diphtheria toxoids, with the first two doses given at least 4 weeks apart and the third dose given 6-12 months after the second. All adults for whom > 10 years have elapsed since completion of their primary series or since their last booster dose should receive a booster dose of Td. Thereafter, a booster dose of Td should be administered every 10 years. Doses need not be repeated if the primary schedule for the series or booster doses is delayed.

Complete and appropriately timed vaccination is nearly 100% effective in preventing tetanus. Td is the preferred preparation for active tetanus immunization of adults because a large proportion of them also lack protective levels of circulating antitoxin against diphtheria.

Wound management

For wound management the need for active immunization, with or without passive immunization, depends on the condition of the wound and the patient's vaccination history. Table 1 represents a summary of the indications for active and passive immunization.

Evidence indicates that complete primary vaccination with tetanus toxoid provides long-lasting protection (>10 years among most recipients). Consequently, after complete primary tetanus vaccination, boosters are recommended at 10-year intervals. For clean and minor wounds occurring during the 10-year interval, no additional booster is recommended. For other wounds, a booster is appropriate if the patient has not received tetanus toxoid within the preceding 5 years. Antitoxin antibodies develop rapidly in persons who have previously received at least two doses of tetanus toxoid.

Persons who have not completed a full primary series of injections or whose vaccination status is unknown or uncertain may require tetanus toxoid and passive immunization at the time of wound cleaning and debridement. Ascertaining the interval since the most recent toxoid dose is not sufficient. A careful attempt should be made to determine whether a patient has previously completed primary vaccination and, if not, how many doses have been given. Persons with unknown or uncertain previous vaccination histories should be considered to have had no previous tetanus toxoid doses.

In managing the wounds of adults, Td is the preferred preparation for active tetanus immunization. This toxoid preparation is also used to enhance protection against diphtheria, because a large proportion of adults are susceptible. Thus, if advantage is taken of visits for care of acute health problems, such as for wound management, some patients who otherwise would remain susceptible can be protected against both diseases. Primary vaccination should ultimately be completed for persons documented to have received fewer than the recommended number of doses, including doses given as part of wound management.

If passive immunization is needed, human tetanus immune globulin (TIG) is the product of choice. The currently recommended prophylactic dose of TIG for wounds of average severity is 250 units IM. When T or Td and TIG are given concurrently, separate syringes and separate sites should be used. Most experts consider the use of adsorbed toxoid mandatory in this situation.

Table 1: Use of tetanus toxoid in wound management

History of Adsorbed Tetanus Toxoid	Clean, minor wounds		All other wounds*	
	Td ^	TIG	Td ^	TIG
Unknown or fewer than three doses	Yes	No	Yes	Yes
Three or more doses($)	No(@)	No	No (&)	No

* Such as, but not limited to, wounds contaminated with dirt, feces, soil, saliva, etc.; puncture wounds; avulsions and wounds resulting from missiles, crushing, burns, and frostbite.

^ For children younger than 7 years; DPT (DT, if pertussis vaccine is contraindicated) is preferred to tetanus toxoid alone. For persons 7 years or older, Td is preferred to tetanus toxoid alone.

$ If only three doses of fluid toxoid have been received, then a fourth dose of toxoid, preferably an adsorbed toxoid, should be given.

@ Yes, if more than 10 years since last dose.

& Yes, if more than five years since last dose.

Source: MMWR 1987; 36:477-481.

Toxoid side effects and adverse reactions

Local reactions (usually erythema and induration, with or without tenderness) can occur after Td is administered. Fever and other systemic symptoms are less common.

Arthus-type hypersensitivity reactions starting 2-8 hours after an injection and often associated with fever and malaise may occur, particularly among persons who have received multiple boosters of tetanus toxoid adsorbed (T).

Rarely, severe systemic reactions, such

as generalized urticaria, anaphylaxis, or neurologic complications, have been reported after administration of tetanus and diphtheria toxoids. Peripheral neuropathy has been reported rarely after administration of T, although a causal relationship has not been established.

Toxoid precautions and contraindications

Although no evidence suggests that diphtheria and tetanus toxoids are teratogenic, waiting until the second trimester of pregnancy to administer Td is a reasonable precaution.

A history of a neurologic reaction or a severe hypersensitivity reaction (e.g., generalized urticaria or anaphylaxis) after a previous dose is a contraindication to diphtheria and tetanus toxoids. Local side effects alone do not preclude continued use. If a prior systemic reaction suggests allergic hypersensitivity, appropriate skin testing to document immediate hypersensitivity may be useful before T vaccination is discontinued. Mild, nonspecific skin-test reactivity to T toxoid is common. Most vaccinees develop a delayed but inconsequential cutaneous hypersensitivity to the toxoid.

Persons experiencing severe Arthus-type hypersensitivity reactions to a dose of T usually have very high serum tetanus antitoxin levels and should not be given even emergency booster doses of Td more frequently than every 10 years.

If a contraindication to using preparations containing T exists in a person who has not completed a primary immunizing course of T and other than a clean minor wound is sustained, only passive immunization should be given using TIG.

Although a minor illness, such as a mild upper respiratory infection, should not be cause for postponing vaccination, a severe febrile illness is reason to defer routine vaccination.

— Reported by Dr. Abdulaziz A.A. Bin Saeed (Field Epidemiology Training Program)

References

1. ACIP: Recommendations of the Immunizations Practices Advisory Committee. Vaccine-preventable diseases and their immunobiologics. MMWR 1991;40:(no.RR-12)17-19.

2. Tetanus—United States, 1985-1986, MMWR 1987;36:477.

Surveillance

Acute flaccid paralysis

Under the polio eradication initiative, every case of acute flaccid paralysis (AFP), including Guillain-Barre Syndrome, in patients under 15 should be reported immediately to the regional health authorities and the Ministry of Health. These AFP cases will be handled as suspected cases of polio until proven otherwise. Stool specimens should be collected and submitted for virus isolation and a serum sample taken for serology. Reporting of every case of AFP will ensure investigation of all possible polio cases. The eradication effort depends on AFP surveillance data as a basis for actions taken, as an assessment of progress toward the eradication of poliomyelitis, as identification of high-risk areas and as a guide for immunization strategies. Immediate actions triggered by an AFP report target immunization activities at the catchment area of the case, where all children under 5 should receive two doses of oral polio vaccine (OPV) regardless of their previous immunization state. Because the eradication initiative depends on finding every case of polio, it is better to report AFP that is not polio than to risk missing a case that could be polio.

A consistent demonstrable downward trend of poliomyelitis has been seen in the Kingdom between 1977 and 1994, and very low levels have been sustained in the last seven years. However, from 1989 to 1992, low numbers of reported AFP indicated that the surveillance system required improved sensitivity. Accordingly, several new activities were introduced in 1993 to strengthen AFP surveillance. During 1993, AFP reports increased to 43, 10 times more than 1992, using an expected AFP baseline rate of 1/100,000. About 72% of the expected numbers of cases were reported. Continuous improvement has been noted during the first nine months of 1994, during which 58 cases were reported (80% of the expected figure).

The most important activities introduced in the last two years are:

- Formulation of the National Technical Committee for the Poliomyelitis Eradication Program from members working in the

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	1993 (all)	1994 (Jan-Sept)
No. AFP cases reported	43	58
AFP/100,000 < 15 yrs.	0.5	1
AFP cases detected within 1 week of symptoms	80%	84%
AFP cases notified within 24 hours	18%	49%
Control measures within 48 hours	43%	82%
2 stool specimens collected from each case	94%	86%
5 stool specimens collected from each of 5 contacts	70%	77%
% stool specimens received within 3 days	80%	80%
Specimens arriving at lab in acceptable condition	100%	100%
Results returned within 28 days of receiving specimens	80%	80%
Follow-up of cases for 60 days	100%	100%

(INFECTIOUS DISEASE DEPARTMENT – M.O.H.)