



Tdap Utilization In Emergency Departments 2007-2009

Michael J. Smith, M.D., M.S.C.E and Charles R. Woods, M.D., M.S.
Division of Pediatric Infectious Diseases
University of Louisville School of Medicine

ABSTRACT

Background: Although Tdap has been recommended since 2006, coverage remains suboptimal. A single dose of Tdap has been recommended in place of Td for adolescents and adults who require tetanus toxoid-containing vaccine as part of wound management. This provides an opportunity for emergency departments to play a significant role in Tdap vaccination.

Objective: To describe national patterns of Tdap administration during emergency department visits when tetanus toxoid is warranted.

Methods: The National Hospital Ambulatory Medical Care Survey (NHAMCS) is an annual survey of visits to hospital emergency and outpatient departments in the United States. NHAMCS data from 2007-2009 were used to establish patterns of tetanus toxoid-containing vaccination in emergency departments and to identify factors associated with Tdap receipt. All results were weighted to provide nationally representative estimates.

Results: A tetanus toxoid-containing vaccine was administered during 8,200,000 (95% confidence interval (CI) 7,200,000 – 8,700,000) of the nearly 380 million emergency department visits during the study period. Tdap accounted for only 4.4% (95% CI 3.5-5.7%) of the tetanus-containing vaccines administered. Due to the low receipt of Tdap in 2007 and 2008 reliable national estimates could not be calculated; data from these years were pooled. The percentage of Tdap among all toxoid-containing vaccines increased from 4.0% (95% CI 2.9 – 5.6%) in 2007-08 to 5.2% (95% CI 3.6-7.4%) in 2009. Due to low uptake, independent factors associated with Tdap receipt could not be validly and reliably determined.

Conclusions: In the face of ongoing pertussis outbreaks, strategies to maximize Tdap vaccination are needed. Routine Tdap use for wound prophylaxis in the emergency department may provide an effective mechanism to increase uptake. The reasons for underutilization of Tdap in the emergency department setting warrant further investigation.

BACKGROUND AND OBJECTIVE

Since 2006, the Advisory Committee on Immunization Practices (ACIP) has recommended a single dose of a tetanus, diphtheria and acellular pertussis (Tdap) vaccine for all adolescents at the 11-12 year-old visit and in place of routine tetanus-diphtheria (Td) boosters for adults.¹

However, uptake of Tdap remains suboptimal. Only 8.7% of adults aged 19-64 years have received Tdap as of 2010.²

Tdap has also been recommended in place of Td for individuals who require tetanus toxoid-containing vaccine as part of wound management.¹ Using data from the National Hospital Ambulatory Medical Care Survey (NHAMCS) Pallin et al estimated that nearly 26 million doses of tetanus vaccine were administered in emergency departments (EDs) between 1992 and 2000, demonstrating the potential impact of Tdap vaccination in the ED setting.³

We sought to describe national patterns of tetanus vaccination in EDs after the 2006 ACIP recommendation and to identify factors associated with Tdap receipt.

METHODS

Data source: NHAMCS is an annual survey of visits to hospital emergency and outpatient departments in the United States. The survey uses a four-stage probability design with samples of geographic primary sampling units (PSUs), hospitals within PSUs, EDs within the hospitals and patient visits within the EDs. Patient weights that account for each stage in the sampling scheme allow for calculation of nationally representative estimates. NHAMCS data from 2007-2009 were used to establish patterns of tetanus toxoid-containing vaccination in EDs. These years were chosen because a drug code for Tdap first appeared in 2007 and 2009 is the most recent study year with publicly available data.

Study definitions: During the study period administration of up to 8 medications, including vaccines, was recorded for each visit in NHAMCS. Visits were considered to be associated with a tetanus toxoid-containing vaccine if any of the 8 medication fields were assigned any of the following drug codes: 09815 (Diph Tet Toxoids), 09900 (Diphtheria Tetanus Toxoids), 31000 (Tetanus Antitoxin), 31005 (Tetanus Diphtheria Toxoid), 31015 (Tetanus Toxoid), 06129 (Adacel) or 06138 (Boostrix). Only those visits with codes for Adacel or Boostrix were considered to be associated with Tdap receipt.

Statistical analysis: All results were weighted to provide nationally representative estimates using the survey command options within Stata 11.0 (College Station, TX).

RESULTS

From January 2007 through December 2009 there were approximately 377 million ED visits in the United States. A tetanus toxoid-containing vaccine was administered during 8,200,000 (95% confidence interval (CI) 7,200,000 – 8,700,000) of these visits. Tdap accounted for only 4.4% (95% CI 3.5-5.7%) of all tetanus-containing vaccines administered. Because of low uptake in 2007 and 2008 annual Tdap coverage for these years are not reported; data from these years were combined. The percentage of Tdap among all toxoid-containing vaccines increased from 4.0% (95% CI 2.9 – 5.6%) in 2007-08 to 5.2% (95% CI 3.6-7.4%) in 2009. Limiting the cohort to individuals in the labeled age group (10-64 years) minimally increased the proportion of Tdap receipt to 5.8% (95% CI 3.9 - 8.4%) in 2009.

Because of low uptake, independent risk factors associated with Tdap receipt could not be validly or reliably determined.

CONCLUSIONS

Although Tdap has been recommended since 2006, national coverage remains low, particularly among adults. We found that almost 3 million doses of tetanus vaccine were given in the ED setting each year, consistent with earlier estimates from 1992-2000.³ Unfortunately, only a small proportion of tetanus vaccine was given as Tdap. While immunization in the primary medical home is preferred, the ED may provide an alternative setting for adults and adolescents who do not seek routine preventative care. Our data suggest that nearly one percent of the US population could potentially be immunized against pertussis in the ED setting annually. A recently published single-center study demonstrates that it is feasible to administer Tdap in the ED.⁴ However, much work remains to be done at the national level.

LIMITATIONS

Our use of administrative data preclude evaluation of the appropriateness of tetanus vaccination. However, all individuals in the labeled age-group who did receive a tetanus vaccine during the study period should have received Tdap. The only medical contraindication that would favor Td over Tdap is a history of encephalopathy within 7 days of a previous dose of DTaP or DTP, which is a rare occurrence.

Another potential explanation for our findings is that doses of Tdap were incorrectly coded as Td. While this could potentially change the point estimates for Tdap receipt, they would not change our qualitative results; namely, there is significant underutilization of Tdap in the ED setting at the national level.

IMPLICATIONS

Without access to the primary medical records we cannot discern the specific reasons for Tdap non-receipt. However, the most likely explanation is slow diffusion of the ACIP recommendations. The American College of Emergency Physicians issued a policy statement supporting the ACIP recommendation in March 2009, which may have been too late to impact coverage during the study period. Future studies showing better uptake in subsequent NHAMCS years would support this hypothesis. Additional research is needed to better understand the factors associated with suboptimal Tdap administration in the ED setting.

REFERENCES

1. Broder, K.R., et al., *Preventing tetanus, diphtheria, and pertussis among adolescents: use of tetanus toxoid, reduced diphtheria toxoid and acellular pertussis vaccines recommendations of the Advisory Committee on Immunization Practices (ACIP)*. MMWR, 2006. 55(RR-3):1-34.
2. Adult Vaccination Coverage — United States, 2010. MMWR, 2012. 61(4):66-72.
3. Pallin, D.J., et al., *Vaccination practices in US emergency departments, 1992-2000*. Vaccine, 2005. 23(8): 1048-52.
4. Notes from the Field : Use of Tetanus, Diphtheria, and Pertussis Vaccine (Tdap) in an Emergency Department — Arizona, 2009–2010. MMWR, 2012. 61(3):55-6.

