Be Wise, Immunize!

Sahil Mullick MD, Anand Desai MD MBA, Michael Guzman MD, Lindsey Williams MS4, Naureen Rafiq MBBS

Creighton University School of Medicine, Department of Family Medicine, 601 N 30th Street, Suite 6720, Omaha NE 68131

Objectives

To improve the overall immunization coverages in select groups of patient populations.

Introduction

Our study aims to address suboptimal coverage of specific vaccinations for three groups of patient populations.

Group 1: Patients within the age range of 9-26 years who are eligible to receive the HPV vaccination.

The HPV vaccination series is recommended in the aforementioned patient population to protect against cervical disease, including warts and cancer. It can be given to both males and females.

Group 2: Pregnant females at various gestational ages who are eligible to receive the influenza and Tdap vaccination.

Both Tdap and influenza vaccinations are recommended in all pregnant women. Tdap is given between 27 and 36 weeks gestation and it provides protection against pertussis in infants, particularly those less than 1 year of age. Influenza vaccine protects against the large percentage of overall deaths and newborn complications that occur due to influenza virus.

Group 3: Patients between 50-64 years of age with comorbidities such as diabetes mellitus and COPD who are eligible to receive the pneumococcal-23 (PPV-23) vaccine.

An estimated 3,500 people under the age of 65 die as a result of a *Streptococcus pneumoniae* infection annually in the United States. This is despite the availability of the PPV-23 vaccine, which has been shown to prevent 65-75% of *S. pneumoniae*-related bacteremia and meningitis cases. National vaccination data shows that only 34.6% of high-risk individuals between ages 50-64 years receive the vaccine.

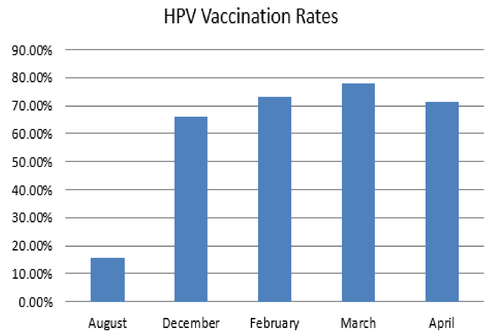
Interventions

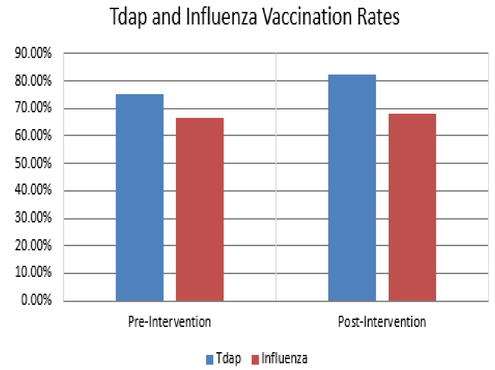
Baseline coverage rates were obtained for period from February 2015 to August 2015. Study began in September 2015.

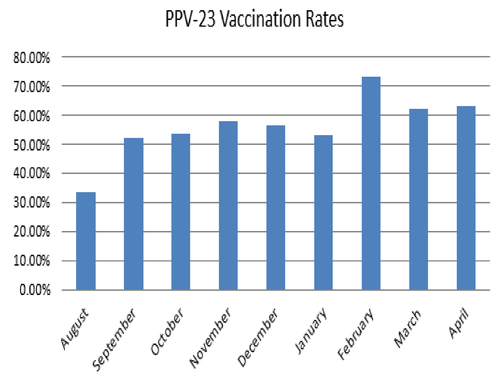
Various simultaneous interventions were implemented, including:
- Verbal education
- Pre-visit forms
- Electronic letters
- Posters
- Wallet-sized immunization record cards
- Daily clinic huddle-time reminders

All materials were translated into Karen, Burmese and Nepali, which are some of the more frequently spoken languages in our patient population.

Data







Results

Vaccine	Pre-Intervention (August 2015)	Post-Intervention (April 2016)
HPV	15.69%	71.60%
Tdap	75.19%	82.52% (March 2016)
Influenza	66.67%	68.03% (March 2016)
PPV-23	33.33%	63.16%

For the HPV group, our pre-intervention vaccination coverage was 15.69%. Post-intervention data collected showed significant increases in vaccination coverage with the following coverage rates: 66.15% (December), 73.17% (February), 77.98% (March), and 71.60% (April).

Our pre-intervention vaccination coverage for the Tdap group was 75.19%. Post-intervention data collected showed an increases in vaccination coverage to 82.52%.

For the influenza group, our pre-intervention vaccination coverage was 66.67%, which increased to 68.03% post-intervention.

For the PPV-23 group, our pre-intervention vaccination coverage was approx. 33.33%. Post-intervention data collected showed significant increases in vaccination coverage with the following coverage rates: 52.17% (September), 53.66% (October), 57.89% (November), 56.41% (December), 52.94% (January), 73.33% (February), 62.16% (March), and 63.16% (April).

Discussion

Trend is overall increasing for all vaccination categories in the pre- and post-intervention groups, which we believe is due to continuous emphasis on the importance of vaccination and the use of our various interventions for each qualifying patient during every clinic visit.

There is a need for future studies to determine which interventions may have accounted for the greatest increase in vaccination compliance. We can reasonably conclude, however, that a multi-faceted campaign to normalize vaccines, educate patients, and consistently encourage providers to review and/or offer vaccines at every visit has potential to increase the prevalence of protected patients.

Limitations

- The sample size was small.
- Refugee patients are required to receive Tdap vaccine as part of their immigration contract, but there is no requirement for them to receive the HPV, PPV-23 and influenza vaccines.
- Patients in the Tdap vaccination group were at different gestational ages. Those under 28 weeks of gestation did not qualify to receive the Tdap vaccine.

Acknowledgments

We would like to thank Dr. Naureen Rafiq for her guidance with this project. We would also like to thank Ms. Tanya Howard for her help with data mining.

References

- Committee on Obstetric Practice. ACOG Committee Opinion No. 566: Update on immunization and pregnancy: Tetanus, diphtheria, and pertussis vaccination. Obstet Gynecol 2013; 121:1411.
- Ding, H., et al. Influenza Vaccination Coverage Among Pregnant Women — United States, 2013–14 Influenza Season. Center for Disease Control and Prevention website morbidity and mortality weekly report. September 19, 2014. 63(37);816-821. http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6337a3.htm?s_cid=mm6337a3_e
- Effectiveness of seasonal trivalent influenza vaccine for preventing influenza virus illness among pregnant women: a population-based case-control study during the 2010-2011 and 2011-2012 influenza seasons. Thompson MG, et al. Clin Infect Dis. 2014 Feb;58(4):449-57. doi: 10.1093/cid/cit750. Epub 2013 Nov 26
- Indu AB, et al. Tetanus, Diphtheria, Pertussis Vaccination Coverage Before, During, and After Pregnancy — 16 States and New York City, 2011. Center for Disease Control and Prevention website morbidity and mortality weekly report. May 22, 2015/64(19);522-526. http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6419a4.htm
- Lau, D., Hu, J., Majumdar, S., Storie, D., Rees, S., & Johnson, J. (2012). Interventions to improve influenza and pneumococcal vaccination rates among community-dwelling adults: A systematic review and meta-analysis. *Annals of Family Medicine, 10*(6), 538-546.
- Musher, D. (Updated 2015). Pneumococcal vaccination in adults. Retrieved from www.uptodate.com.
- Peng-Jun, L., & Nourti, J. (2011). Uptake of pneumococcal polysaccharide vaccination among working-age adults with underlying medical conditions, United States, 2009. *American Journal of Epidemiology, 175*(8), 827-837.