

# Prevalence and immunization coverage of asplenic patients at a community hospital in Omaha, Nebraska



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## Background

- The spleen plays an important role in immune response to infections caused by encapsulated bacteria: *Streptococcus pneumoniae* (50-90% of cases), *Neisseria meningitidis*, and *Haemophilus influenzae type B*
- Patients with reduced or absent splenic function are at high risk for infections by encapsulated bacteria which can cause rapidly progressive meningitis, pneumonia and/or sepsis, referred to as Overwhelming Post-Splenectomy Infections (OPSI)
  - Before widespread immunization, the lifetime risk of developing OPSI was 3.2%, with a mortality rate of nearly 50% among patients that develop OPSI
  - Immunizations reduce the risk of developing OPSI
- Causes of asplenia include:
  - Surgical Splenectomy – the surgical removal of the spleen, most commonly secondary to trauma that causes splenic rupture and hemorrhage
  - Diseases causing damage to the spleen like: Sickle Cell Anemia, Hereditary Spherocytosis, Immune Thrombocytopenia purpura, Thalassemia
- Immunizations recommended for asplenic patients include:
  - Pneumococcal (PCV13 and PPSV23)
  - Hib Conjugate
  - Meningococcal (both ACWY and MenB vaccines)
  - Influenza

## Results

	Total (N=519)	Congenital (n=33)	Acquired (n=486)	Acquired (n=486)	
				Surgical Splenectomy (n=98)	Unknown (n=388)
<b>Age in Years</b>					
Mean (Range)	60.2 (1-99)	57 (1-79)	60 (17-99)	61 (22-99)	60 (17-96)
Under 65	295 (56.8%)	26 (78.8%)	269 (55.4%)	64 (65.3%)	205 (52.8%)
65 and Above	224 (43.2%)	7 (21.2%)	217 (44.7%)	34 (34.7%)	183 (47.2%)
<b>Immunization</b>					
Meningococcal ACWY	45 (8.7%)	1 (3.0%)	44 (9.1%)	9 (9.2%)	35 (9.0%)
Pneumococcal	430 (82.9%)	29 (87.9%)	401 (85.5%)	86 (87.8%)	315 (81.2%)
Hib	121 (23.3%)	8 (24.2%)	113 (23.6%)	37 (37.8%)	76 (19.6%)
Influenza in the past year	222 (42.8%)	16 (48.5%)	206 (42.4%)	38 (38.8%)	168 (43.3%)

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				Surgical Splenectomy (n=98)	Unknown (n=388)
<b>Immunization Coverage</b>					
At least one dose of all recommended vaccines	8 (1.5%)	0 (0%)	8 (1.6%)	0 (0%)	8 (2.1%)
Has not received a dose of any recommended vaccine	44 (8.5%)	3 (9.1%)	41 (8.4%)	9 (9.2%)	32 (8.3%)

\* Notes: Only one pneumococcal vaccination was listed; Men B vaccination was not listed

## Limitations

- It is important to consider the project's constraints when interpreting the results
  - Data did not reflect number of doses given or completion of a series
  - Only PPSV23 or PCV13 administration was listed
  - Data did not include MenB coverage
  - The underlying cause of acquired asplenia was not provided
  - There was no information on occurrence of OPSI or associated sequelae, either morbidity and mortality
  - Specific information on demographic (race, gender, educational status, socioeconomic status or insurance status) was lacking

## Conclusions and Next Steps

- Despite limitations, this project suggests that the immunization needs of this asplenic cohort may not have been met
- Limitations reflect opportunities for improvement in future quality assurance efforts assessing immunization trends among high-risk adults
- A targeted full chart review of a random sample of the subjects included in this project is suggested
- The goal should be to capture full immunization histories and data points that were not accessed during this project
- A literature review described strategies that have been shown to improve immunization coverage among asplenic patients:
  - Establish a plan to screen asplenic patients, evaluating their need for immunizations and/or other services
  - Use of Immunization Standing Orders for asplenic patients
  - Assign a nurse practitioner to assess and monitor asplenic patients, providing vaccines and follow-up patient education

## Methods

- A retrospective cohort of asplenic patients in the Nebraska Methodist Health System
- Collaboration between Methodist Physicians Clinic (MPC) and the Immunization Task Force (ITF) – Metro Omaha
- Patients included in the study met all the following conditions:
  - Had a patient record in the Methodist Health system
  - Had a clinical visit or hospital admission in the past five years
  - Had a billing code related to asplenia
- MPC coding and billing staff pulled de-identified information regarding patient's current immunization status

## Discussion

- Results reflect a limited but crucial first step in characterizing this Health System's asplenia population
- Data suggests there is room to improve immunization coverage for all of the recommended vaccines
  - Only eight (1.5%) patients had documentation of at least one dose of all recommended vaccines
- Pneumococcal coverage was highest among the recommended vaccines. 82.9% of patients had received at least one dose of one pneumococcal vaccine (either PCV13 or PPSV23)
  - Both PCV13 and PPSV23 are recommended for asplenic patients; data on coverage of both vaccines was unavailable

## Acknowledgments

- Linda Ohri, Pharm.D., M.P.H, Immunization Task Force – Metro Omaha
  - Rudolf Kotula, MD, FACP, FIDSA - Methodist Physicians Clinic
  - Laurie O'Byrne, Susan Arens, and Mary Thomas – Methodist Physicians Clinic
  - Bud Shaw, M.D. – UNMC COM
  - Armando De Alba Rosales, M.D., M.P.H. – UNMC COPH
- \*References available upon request