Human Vaccines & Immunotherapeutics

ISSN: 2164-5515 (Print) 2164-554X (Online) Journal homepage: https://www.tandfonline.com/loi/khvi20

Immunization coverage among splenectomized patients: Results of an ad hoc survey in Puglia Region (South of Italy)

Carmen Martino, Maria Serena Gallone, Michele Quarto, Cinzia Germinario & Silvio Tafuri

To cite this article: Carmen Martino, Maria Serena Gallone, Michele Quarto, Cinzia Germinario & Silvio Tafuri (2016) Immunization coverage among splenectomized patients: Results of an ad hoc survey in Puglia Region (South of Italy), Human Vaccines & Immunotherapeutics, 12:5, 1277-1279, DOI: 10.1080/21645515.2015.1138025

To link to this article: https://doi.org/10.1080/21645515.2015.1138025

Published online: 15 Apr 2016.

HUMAN VACCINES & IMMUNOTHERAPEUTICS
2016, VOL. 12, NO. 5, 1277–1279
http://dx.doi.org/10.1080/21645515.2015.1138025

Taylor & Francis
Taylor & Francis Group

SHORT REPORT

Immunization coverage among splenectomized patients: Results of an ad hoc survey in Puglia Region (South of Italy)

Carmen Martino, Maria Serena Gallone, Michele Quarto, Cinzia Germinario, and Silvio Tafuri

Department of Biomedical Science and Human Oncology, Aldo Moro University of Bari, Bari, Italy

ABSTRACT

Patients with anatomic or functional asplenia have a 10–50 times higher risk than general population to develop Overwhelming Post-Splenectomy Infection. Evidences are unanimous in recommending splenectomised patients to receive meningococcal, antipneumococcal and Haemophilus influenzae type B vaccinations according to a specific timing. In Italy there are no current data on the immunisation coverage in these patients. This study aims to investigate immunisation coverage in patients undergoing elective or urgent splenectomy for 2012–2013 in the 3 Apulian hospitals. The patients discharged with the code ICD-9-CM 41.5 - "Total splenectomy" were enrolled. The administration of vaccines was verified through consultation of medical records, archives of general practitioners and vaccination offices. In the study period, 166 subjects underwent splenectomy and none of them received vaccinations during hospitalization. 25 splenectomised patients (15.1%) received at least one of the recommended vaccinations. 21 patients (12.6%) received vaccine against Streptococcus pneumonia, 13 (7.8%) meningococcal vaccine, 10 patients (6%) Haemophilus influenzae type B vaccine. The low vaccination coverage could be due both to poor perception of the risk of infection and to a lack of knowledge on vaccinations by surgeons. For this reason it is necessary to draw up and share operational protocols that establish the administration of vaccines.

ARTICLE HISTORY
Received 9 November 2015
Revised 17 December 2015
Accepted 30 December 2015

KEYWORDS
risk of infection; recommended vaccinations; splenectomy; survey; timing of vaccine administration

Patients with anatomic or functional hypo- / asplenia have a 10–50 times higher risk than the general population to develop OPSI (Overwhelming Post-Splenectomy Infection). OPSI are serious bacterial infections characterized by a prodromal phase with nonspecific symptoms such as fever with chills, myalgia, gastrointestinal disorders, headaches that can evolve, after a rapid progression of infection, in a severe sepsis and disseminated intravascular coagulation or Multi Organ Failure Syndrome Waterhouse-Friderichesen, severe hypotension with evolution to shock, *purpura fulminans* with necrotic foci disseminated particularly at the extremities.[1]

The OPSI represent a medical emergency and have a fatal evolution in 50–80% of cases; despite antibiotic therapy and supportive care, 50–70% of deaths occurs within the first 24 h of onset of symptoms, 80% within 48 h. Moreover, patients who survive the acute phase may have long-term complications of the brain or even foci of osteomyelitis or necrosis which may sometimes require amputation of limbs.[2]

In splenectomised patients, 30% of OPSI occurs within the first year after surgery and 50% within the first 2 y. The risk of developing a OPSI is overall estimate of 7% in the first 10 y after surgery and then fall to less than 1% thereafter. Anyway fulminant sepsis have also been reported in adults at a distance of 20–40 y after splenectomy.[3]

The most recent evidence and indication of scientific societies are unanimous in recommending splenectomised patients to receive meningococcal vaccinations, anti-pneumococcal and Haemophilus influenzae type B right after splenectomy. In addition, because of the increased risk of secondary bacterial infections, patients with anatomic or functional asplenia should receive an annual influenza vaccine.[4-6]

For patients undergoing emergency splenectomy, vaccinations recommended should be administered within the first 72 h after surgery or no later than the next 2 w. For patients undergoing elective splenectomy, the administration of the recommended vaccinations must be completed from 4 to 6 w before splenectomy. If the administration of vaccines is not possible before splenectony, it has to be postponed in the 2 w after splenectomy.[7]

Despite these recommendations have been implemented by the National Prevention Plan Vaccination, in Italy there are no current data on the vaccine coverage achieved in patients with hypo- / asplenia.[4]

This study aims to investigate the immunisation coverage in patients undergoing elective or urgent splenectomy for 2012–2013 in the 3 hospitals located in the city of Bari ("Policlinico" general hospital, "Di venere" general hospital, "San Paolo" general hospital). The study has been carried out from September 2014 to March 2015.

In order to create a list of splenectomised patients, all the patients discharged in 2012–2013 from the 3 hospitals with the code ICD-9-CM 41.5 - "Total splenectomy" were extracted from the regional hospital discharge records (SDO). In our analysis, we did not consider patients who died during the hospitalization.

CONTACT Maria Serena Gallone serenagallone@gmail.com Department of Biomedical Science and Human Oncology, Aldo Moro University of Bari, Bari, Italy.

For all the patients in the list, basic demographic characteristics (such as sex, age), type of splenectomy (elective or urgent) and the indications for vaccination were collected. The administration of vaccines and the time of the schedule were verified through consultation of medical records, archives of general practitioners and of vaccination offices. It was also consulted the hospital discharge papers to assess the presence of the recommendation to the execution of the vaccines at discharge.

For data collection was used an *ad hoc* form, the completed forms were computerized using a database created by FileMakerPro and data were analyzed by STATA MP11.

The protocol of the study has been approved by the Regional Committee for the Epidemiology (Osservatorio Epidemiologico Regione Puglia). In accordance with Apulian Regional Laws, permission from the Ethics Commitee was not necessary for retrospective epidemiological study that did not provided tests or experiments on humans or animals. The research was carried out in accordance with the Helsinky declaration.

In the study period, 166 subjects underwent splenectomy and none of them received vaccinations during hospitalization. It was possible to examine the hospital discharge paper of 87 (66.4%) of them and only in 12 cases (9.2%) the paper contained indications for vaccinations.

Twenty-five splenectomised patients (15.1%) received at least one of the recommended vaccinations. In particular 66.6% (8/12) of patients who received the recommendation to the execution of vaccination were vaccinated.

Twenty-one patients (12.6%) received the vaccination against *Streptococcus pneumoniae*: 14 (8.4%) the 13-valent conjugate vaccine, 5 (3%) the 23-valent polysaccharide vaccine while for 2 patients the information on vaccine type was not available. The average time between surgery and vaccination was 145 ± 134.5 d (median 104 d).

Thirteen splenectomised patients (7.8%) received a meningococcal vaccine: 8 (4.8%) the tetravalent conjugate vaccine, 4 (2.4%) the monovalent meningococcal serogroup C and 1 the tetravalent polysaccharide vaccine (0.6%); between splenectomy and vaccination92 ± 109.5 d has passed (median 51 d)

Ten patients (6%) received vaccine against *Haemophilus influenzae* type B (Table 1) after a mean time of 82 ± 51.2 d after surgery (median 84).

The analysis of data reveals that in patients undergoing splenectomy for 2012–2013 in 3 Apulian hospitals – that are referral at regional level – the use of immunoprophylaxis is still totally unsatisfactory, both in terms of immunization coverage and in terms of timing between surgery and immunization, which should be contained in 14 d.[3,7]

Table 1. Number and proportion of enrolled asplenic patients (n=166) who received vaccinations recommended.

Type of vaccine	n	%
Vaccine against S. Pneumoniae	21	12.6
13-valent conjugate vaccine	14	8.4
23 valent polysaccharide vaccine	5	3.0
N.A.	2	1.2
Meningococcal vaccine	13	7.8
Quadrivalent ACYW135 conjugate vaccine	8	4.8
Monovalent anti-Men C vaccine	4	2.4
Quadrivalent ACYW135 polysaccharide vaccine	1	0.6
HIB	10	6.0
Almost one of recommended vaccine	25	15.1

The results of this study are consistent with others that confirm immunoprophylaxis in patients hypo / asplenic is not yet fully satisfactory.[8-9] Only the retrospective study of Coignard-Biehler et al, conducted in 3 French hospitals showed, over a period of 6 y, vaccine coverage against pneumococcal quite satisfactory (70.8%); the same study reported coverage for Hib and meningococcal vaccine respectively of 44 and 24%, in line with other international studies.[10-13]

One of the strengths of our study is the consultation of several information sources (regional hospital discharge records, discharge letters, archives of vaccination offices and general practitioners) that makes the information collected more reliable; however, exactly the plurality of sources makes the search method scarcely reproducible and this represents the main limitation of our study. Perhaps, some vaccine administered during hospitalization could not be reported in medical records.

The low vaccination coverage in this group of patients could be due both to poor perception of the risk of infection as well as to a lack of knowledge of recommended vaccinations by surgeons.[4] Moreover, in Italy the link between hospitals and local offices deputies to vaccinations remains weak and often the opportunity to be vaccinated risks to be entrusted to the sensitivity of patient. Precisely for this reason, it is necessary to draw up and share operational protocols that establish the administration of vaccine at the hospital, in a short preceding period of surgery for elective splenectomy and right after the surgery for emercengy splenectomy. Moreover, there is a good evidence about the role of the asplenic patients registry in improving the compliance with antibiotic prophylaxis and immunization, as showed in a study carried out in 1999 in UK.[13]

Abbreviations

OPSI Overwhelming Post-Splenectomy Infection
SDO hospital discharge records

Disclosure of potential conflicts of interest

No potential conflicts of interest were disclosed.

References

[1] Morgan TL, Tomich EB. Overwhelming post-splenectomy infection (OPSI): a case report and review of the literature. J Emer Med 2012; 43(4):758-763; http://dx.doi.org/10.1016/j.jemermed.2011.10.029
[2] Rizalea BA, Keister KJ, Russel AC. Prevention of sepsis after splenectomy. Pediatric Blood Cancer 2010; 29:65-68.
[3] Newland A, Provan D, Myint S. Preventing severe infection after splenectonomy. BMJ 2005; 331:20-27.
[4] Carlino C, Zaratti L, Lucciola G, Franco E. National Vaccine Prevention Plan (PNPV) 2012–2014 in the Italian Regions. Ig Sanita Pubbl 2013Jan–Feb; 69(1):131-43; PMID:23532166
[5] Davies JM, Lewis MP, Wimperis J, Rafi I, Ladhani S, Bolton-Maggs PH; British Committee for Standards in Haematology. Review of guidelines for the prevention and treatment of infection in patients with an absent or dysfunctional spleen: prepared on behalf of the British Committee for Standards in Haematology by a working party of the Haemato-Oncology task force. Br J Haematol 2011 Nov; 155(3):308-17; PMID:21988145; http://dx.doi.org/10.1111/j.1365-2141.2011.08843.x

[6] Jones P, Leder K, Woolley I, Cameron P, Cheng A, Spelman D. Post-splenectomy infection - strategies for prevention in general practice. Aust Fam Physician 2010 Jun; 39(6):383-6; PMID:20628676

[7] Davies JM, Barnes R, Milligan D; British Committee for Standards in Haematology. Working Party of the Haematology/Oncology Task Force. Update of guidelines for the prevention and treatment of infection in patients with an absent or dysfunctional spleen. Clin Med 2002; 2:440-443; http://dx.doi.org/10.7861/clinmedicine.2-5-440

[8] Di Sabatino A, Carsetti R, Corazza GR. Post-splenectomy and hyposplenic states. Lancet 2011; 378: 86-97; PMID:21474172; http://dx.doi.org/10.1016/S0140-6736(10)61493-6

[9] Kotsanas D, AlSoffiu MH, Waxman BP, King RWF, Polkinghorne KR, Woolley IJ. Adherence to guidelines for prevention of post splenectomy sepsis. Age and sex are risk factors: a five year retrospective review. ANZ J Surgerg Care 2006; 76:542-547; http://dx.doi.org/10.1111/j.1445-2197.2006.03775.x

[10] Coignard-Biehler H, Lanternier F, Hot A, Salmon D, Berger A, de Montalembert M, Suarez F, Launay O, Lecuit M, Lortholary O. Adherence to preventive measures after splenectomy in the hospital setting and in the community. J Infect Public Health 2011 Sep; 4 (4):187-94; PMID:22000846; http://dx.doi.org/10.1016/j.jiph.2011.06.004

[11] Brigden ML, Pattullo A, Brown G. Practising physician's knowledge and patterns of practice regarding the asplenic state: the need for improved education and a practical checklist. Can J Surg 2001; 44 (3):210-6; PMID:11407832

[12] Woolley I. Cost-effectiveness of a post-splenectomy registry for prevention of sepsis in the asplenic. Aust N Z J Public Health 2006; 30 (6):558-61; PMID:17209273; http://dx.doi.org/10.1111/j.1467-842X.2006.tb00786.x

[13] Spickett GP. Northern region asplenia register—–analysis of first two years. J Clin Pathol 1999; 52(6):424-9; PMID:10562809; http://dx.doi.org/10.1136/jcp.52.6.424