



EPIET REPORT

Summary of work activities

Paulius Gradeckas

European Programme for Intervention
Epidemiology Training (EPIET), 2011 cohort

Background

Pre-fellowship short biography

Prior to EPIET, Paulius Gradeckas graduated from Kaunas University of Medicine where he got a Masters in Public Health. After graduation he worked at the Public Health Bureau as Health Promotion and Environmental Health specialist in Kaisiadorys municipality for two years. In 2011, before joining EPIET, he worked for a short time for the Centre for Communicable Diseases and AIDS of Lithuania.

EPIET assignment

On 19 September 2011, Paulius Gradeckas was assigned to the Department of Epidemiology, National Centre for Epidemiology, Budapest, Hungary.

Fellowship projects

Surveillance project

Changing epidemiology and risk factors of hepatitis B in Hungary

Background: From 1995 to 2008, 2 009 cases of acute hepatitis B were notified in Hungary resulting in 46 deaths. In 1995, the National Center for Epidemiology (NEC) started enhanced surveillance (SYST) for acute viral hepatitis in Hungary. Starting from 1999, Hungary has universal vaccination from hepatitis B for adolescents (14 years old). We estimated the reported rates of and potential risk factors for acute HBV infection in Hungary from 1999 to 2008.

Methods: SYST used case definition based on clinical and serological criteria: clinical case definition and laboratory confirmation (IgM antibody to anti-HBc or HBV nucleic acid in serum). The enhanced surveillance system of viral hepatitis collects information on potential risk factors. Epidemiologists collect information on potential risk factors, including occupational exposures to blood, injection drug use (IDU), sexual behaviour, and healthcare exposures. We estimated the reported hepatitis B rates over a 10-year period giving annual reported incidence (per 100 000 population) and we calculated the proportions of reported exposures among cases.

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Results: Reported acute hepatitis B rates remained stable in 1999–2005 (average, 1.1 cases per 100 000 population). In 2006–2008, rates dropped below 1.0 case per 100 000 population. From 1999 to 2008, epidemiological information available for 93% of cases indicated that 51% of cases did not report any potential risk factors. Anti-HBc IgM was positive for 839 out of 1161 reported cases. The median age increased from 35 years in 1999 to 42 years in 2007. The proportion of cases reporting healthcare exposure increased from 30% in 1999 to 38% in 2008.

Conclusions: Hepatitis B rates decreased with an increase in (1) age of infection and (2) the proportion of cases reporting healthcare exposures. We recommended analytical epidemiological investigations to assess the relative contributions of medical interventions and sexual behaviour in HBV transmission.

Key words: Viral hepatitis, hepatitis B, risk factors, infectious disease surveillance.

Status: 'Completed'; Internal report prepared

Surgical site infections in Hungary: 7-year results of a national surveillance network [1,2]

Surgical site infections (SSIs) cause increased length of hospital stay and mortality. It was shown that surveillance has a positive public health impact in reducing infection rates. We aimed to describe characteristics of patients operated on and reported as having SSIs by surgical category and risk index, as well as to assess SSI trends over time in Hungary based on surveillance data reported to the SSI component of the national surveillance system for nosocomial infections (NNSR). We analysed 64 126 records reported from 2005 to 2011. There were 1 625 SSIs detected, caused mainly by Gram-positive cocci, Enterobacteriaceae or Gram-negative non-fermentative bacilli. The decrease in infection rates over the last years was seen in gallbladder and caesarean surgeries or knee replacements. We recommend continuing surgical site surveillance focusing on the most common surgical categories in the hospitals.

Status: 'Completed'; abstract presented on a scientific conference, [1] Manuscript drafted [2]

Outbreak

Salmonella enteritidis outbreak in Szeged, July 2012, Hungary

Background: On 22 June 2012, cases with gastrointestinal symptoms were reported from a local paediatric clinic, in Szeged, Hungary. The local public office started an outbreak investigation.

Methods: We defined a case as a person who had consumed food produced by company X from 18–22 June to and who had at least one of the following symptoms: diarrhoea, vomiting, fever or abdominal cramps. We sent 28 stool specimens for laboratory testing. We created a questionnaire based on the menu and public health officers interviewed 86% of persons exposed. We described the outbreak by time, place and person and conducted a cohort study to identify the source of infection. We conducted additional environmental investigations to see food handling procedures in company X.

Results: We identified 97 cases among 213 patients (attack rate: 46%) between 18 June and 1 July. Twenty four specimens tested positive for *S. Enteritidis*. The attack rate was highest among 5–14 years olds (55%). Cases first occurred on 19 June, there was a peak on 20 of June and two late cases appeared on 25 June. Compared with unexposed, the exposed did not differ in terms of age and sex. However, all 97 cases ate pork for lunch 19 June (relative risk: ∞). An environmental assessment of food handling practices at company X indicated the cross-contamination of pork from raw poultry.

Conclusions: Pork ate AT lunch on 19 of June may have been the source of this outbreak of *S. Enteritidis*. We recommended owners of company X to correct structural and operational deficiencies found immediately.

Key words: Outbreak, *S. Enteritidis*, food handling

Status: 'Completed'; Internal report prepared

Hepatitis A outbreak affecting men who have sex with man in Budapest, in 2012 [3]

Background: A community-wide outbreak of hepatitis A evolved in Hungary between January and December 2012. We investigated in order to identify risk factors for infection and take preventive measures.

Methods: We defined a case as laboratory-confirmed IgM positive hepatitis A case reported between 1 January and 9 December 2012 with an epidemiological link to an index case in Budapest. We stimulated passive surveillance to find cases reported to regional offices. We collected information on exposures in the month before the onset using standardised questionnaires regarding recent travel, family, sexual or occupational contact with hepatitis A case and sexual orientation. We compared cases recruited among consenting men who lived in Budapest and declared themselves as having sex with men (MSM), with controls recruited among MSM in Budapest from the clients of civil organisations sending a link to an electronic questionnaire. We collected blood specimens from a random sample of case-patients to genotype them with PCR in the reference laboratory.

Results: We identified 60 cases (53 males) among residents of Budapest, Pest and Heves counties. Thirteen cases (23%) had a close contact with another patient with hepatitis A, 14 (25%) travelled and/or stayed abroad. Of 45 cases contacted for the case-control study, seven (15%) responded. Compared with 70 controls, MSM cases were

more likely to report >11 sexual partners in the last 12 months (18% and 71%, respectively; odds ratio 12, 95% 2.1–70). 19 (67 %) of 27 specimens tested were positive for strain IA.

Conclusions: This community-wide outbreak of hepatitis A virus affected the MSM community and spread out to the general population. We emphasised the need to vaccinate risk groups, including MSM.

Key words: MSM, hepatitis A, risk behaviour.

Status: 'Completed'; Manuscript drafted³

An outbreak of hepatitis A in Budapest related to attending a punk concert [4]

Background: In January 2013, a Budapest hospital notified the Regional Public Health office of four hepatitis A cases. These cases attended a punk concert on 1 December 2012 in a club. The National Centre for Epidemiology investigated the outbreak to identify the source.

Methods: We conducted a case-control study to investigate the hypothesis that the outbreak was associated with using a restroom in the club or drinking an unidentified alcoholic drink. Cases were people IgM positive for hepatitis A, diagnosed after 15 December 2012, who visited the punk concert. We used snowball sampling for finding controls defined as persons that attended the concert in club X but had no hepatitis A symptoms after 15 December and who had not been previously vaccinated against it. We made an environmental inspection at the site of the outbreak. We collected information on exposures using a standardised questionnaire. We calculated odds ratios and 95% confidence intervals.

Results: We identified 15 cases that were in the club X premises on the 1 December. We found that all cases included in the study had used the rest room in the club at least once and that frequent use of rest rooms (> 1 time) was associated with disease (OR = 11.0; 95% CI: 1.2 – 509.0). There were two cases (13%) and three controls (14%) exposed to the unidentified alcoholic drink who were drinking outside the club (OR = 1.0; 95% CI: 0.1 – 8.8).

Conclusions: We found that the use of rest rooms was associated with the outbreak. We suggest informing the general population about the importance of hand hygiene via posters in the rest rooms of public places such as bars and clubs.

Key words: outbreak, hepatitis A, hygiene standards, events.

Status: 'Completed'; Abstract presented at ESCAIDE 2013⁴

Research

Deteriorating compliance with antimicrobial prophylaxis recommendations in hip replacement surgeries in the last six years in Hungary [5,6,7]

Background: In 2005, a study concluded that 51.7% of patients received appropriate antimicrobial prophylaxis (AP) regarding the choice of agent and duration of administration in hip arthroplasties (HPRO) in Hungary. We investigated whether AP practice in HPRO has improved during recent years.

Methods: We analysed data reported to the surgical site infection module of the Hungarian National Nosocomial Surveillance System (NNSS) in 2010–2011. We calculated proportions of appropriate AP practice in relation to the choice of antimicrobial and duration of its administration.

Results: We analysed records on 798 HPRO surgeries performed in eight hospitals. Recommended Cefazolin and Cefuroxime were used in 42.0% and 24.9% of surgeries, respectively, as first-and-only choice. There was an increase of recommended Cefazolin usage compared to the previous study (42% vs. 34%, $p < 0.001$). Not recommended third-generation cephalosporins (Cefotaxim, Ceftriaxone) were used (24.9%). More than one antimicrobial was prescribed to 5% patients. The proportion of cases with AP lasting less than 24 hours on the day of surgery decreased compared with the previous study (79.4% vs. 54.0%, $p < 0.5$). Overall 44% of patients received appropriate surgical prophylaxis, regarding both type of antimicrobial and duration of AP.

Conclusions: Our results suggest that AP practice in HPRO has deteriorated in Hungary since 2005, although improvements were seen in the first-choice agent. Extensive efforts, including communication with professional societies, local feedback and education should focus on improving surgeons' compliance with the existing recommendations on antimicrobial prophylaxis. Collecting data on timing of AP in NNSS should be considered for better assessment.

Key words: Hip prosthesis, antibiotic prophylaxis, recommendations.

Status: 'Completed', abstracts presented at international conferences [5,6,7]

Introduction of new strain of BCG vaccine in Hungary: excess of adverse effects caused by vaccination in six-month follow-up period ⁸

Background: In 2012, Hungary started to vaccinate newborns with vaccines containing the BCG Bulgaria strain, replacing the previously used BCG SSI strain. The National Center for Epidemiology (NCE) estimated the frequency and nature of adverse reactions (ARs) to the vaccine BCG Bulgaria.

Methods: We enrolled volunteering physicians from all 19 administrative regions in Hungary. We asked investigators to collect information on ARs following BCG vaccination recorded during healthy child visits, at the ages of 1, 2, 3 and 6 months for children born between September and November 2012. We used the WHO definitions for adverse events, based on which we designed a notification form and database. We included records having all four healthy child visits. We followed up vaccinated children and calculated incidence of adverse reactions dividing the number of newborns with reactions by the total number of vaccinees for whom follow-up information was available.

Results: There were 2 400 vaccine doses administered containing BCG Bulgaria in 2012. After six months of follow up, we found that 2 298 (96%) of infants had a scar (normal reaction to vaccine) in the vaccination site. The most common adverse reaction detected was abscess (0.4%) while other adverse reactions (bacterial infection, ulceration or lymphadenitis) were detected less commonly (0.1% each). Forty percent of ARs detected were noticed after the healthy child visit at the second month.

Conclusions: We estimated that 96% of vaccinated persons had a normal reaction to the vaccine. We found that the most ARs to the BCG vaccine - abscesses and regional lymphadenitis, were no more frequent (0.4% and 0.1%, respectively) than the expected and corresponded to the proportion of 1% reported in literature. No severe local reactions were detected.

Key words: adverse reactions, BCG Bulgaria, vaccine, infants.

Status: 'Completed', Technical report, Abstract presented at ESCAIDE 2013 [8]

Scientific communication

- Two oral communications: one at the annual conference for Hospital Hygienists (Mátraháza) five and other at the XVI Congress of Infection Control association (Balatonalmadi) [1]
- Two posters presented; one at 2nd European Conference on Antimicrobial Resistance and Infection Prevention (Vilnius) [6]; one at ESCAIDE 2012 (Edinburgh) [7]
- Two manuscripts drafted [2,3], 0 manuscripts submitted, 0 manuscripts accepted and 0 manuscripts published.
- Two abstracts submitted and accepted for ESCAIDE 2013 (Stockholm) [4,8]

Teaching experience

Facilitation of a course for doctoral students

Paulius Gradeckas facilitated a course of Epidemiology of Infectious disease for doctoral students studying in the International Postgraduate Programme in Epidemiology in Tampere School of Public Health. During the one week course he facilitated four case studies and gave one lecture on case-control study design.

Facilitation of an NCE course for senior epidemiologists

Paulius Gradeckas together with another two fellows facilitated a course on Epidemiology of Infectious disease for senior epidemiologists in the National Center for Epidemiology (Hungary) and gave one lecture on studies designs.

Others

Paulius Gradeckas took part in the European project 'Screening for hepatitis B and C among migrants in the European Union' pilot study in Hungary. He was responsible for study implementation, communication with international stakeholders and data analysis.

Supervisor's comments

During his EPIET training, Paulius Gradeckas gained a comprehensive practical and theoretical knowledge in the field of epidemiology for both the classical communicable diseases and nosocomial infections.

In 2012, he participated in the investigation on the spot for the Hepatitis A outbreaks in Budapest. He independently planned and implemented the analytic epidemiological studies, thus, supporting the local experts' work. With regard to public health aspects, the study on the adverse effects following immunisation with the Bulgarian BCG vaccine in Hungary was of great importance. With his results, he could satisfy the professional opinion that the introduction of

the new Bulgarian BCG vaccine had not caused an increase of adverse effects. In the module for Surgical Site Infections (SSI) of National Nosocomial Surveillance, he highlighted the changes in the epidemiology for SSI based on seven years of data. He actively joined in the pilot survey aimed at the screening of pregnant migrant women performed within the EU project (Hepscreen) and coordinated in the training site. He tackled the challenging current national and international tasks on a high level and sparing no pains or time.

Paulius Gradeckas did become an expert who is prepared, confident and can be a useful member of the public health expert community in Europe.

Next steps

Paulius Gradeckas found a job in Lithuania and will work for a governmental investing company that operates in the field of biotechnologies. He has plans to pass his experience and knowledge to colleagues/students, and his long term plan is to make the Centre for Communicable Diseases and AIDS in Lithuania a EPIET training site.

References

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2. Gradeckas P, Kurcz A, Hajdu Á, Böröcz K. Surgical site infections in Hungary: 7-year results of a national surveillance network. Manuscript in preparation.
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4. Gradeckas P, Krisztalovics K, Kozma E, Csohan Á: An outbreak of hepatitis A in Budapest related to visiting a punk concert. Paper presented at: European Scientific Conference on Applied Infectious Disease Epidemiology; 2013 November 5-7; Stockholm, Sweden.
5. Gradeckas P, Kurcz A, Hajdu Á, Böröcz K: Deteriorating compliance with antimicrobial prophylaxis recommendations in hip replacement surgeries in the last six years in Hungary. Paper presented at: The annual conference for Hospital Hygienists; 2012 September 20-21; Mátraháza, Hungary.
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8. Gradeckas P, Molnar Z, Brachmann K, Csohan A, Pauliny Z: Introduction of new strain of BCG vaccine in Hungary: excess of adverse effects caused by vaccination in 6 month follow-up period. Paper presented at: European Scientific Conference on Applied Infectious Disease Epidemiology; 2013 November 5-7; Stockholm, Sweden.