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Low varicella-related consultation rate in the Netherlands in primary care data☆

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ABSTRACT

Background: In the Netherlands, a relatively low varicella disease burden compared to other European countries is observed within routine surveillance. To validate this, we estimated the varicella-related consultation rate using The Integrated Primary Care Information database.
Methods: In this retrospective cohort study, varicella patients in 2006–2008 were identified by the International Classification of Primary Care (A72) and free text in the electronic medical records, and manually reviewed to be categorised as 'varicella' or 'probable varicella'. The incidence of GP-consultation, specialist referral, emergency department contact and hospitalisation due to varicella was calculated, standardised to the Dutch population.
Results: We identified 1881 varicella cases (2348 including probable cases), 14 patients were hospitalised. The overall incidence of GP-consultation due to varicella per 100,000 person-years was at least 281 (95%CI 268–294) and when probable cases were also included at maximum 354 (95%CI 340–369). The overall incidence of specialist referral, emergency department contact and hospitalisation per 100,000 person-years was 3.9 (95%CI 2.7–5.6), 2.5 (95%CI 1.5–4.0) and 2.0 (95%CI 1.2–3.4) respectively.
Conclusions: This study confirms the relatively low disease burden due to varicella in the Netherlands. In this study, using primary care data, similar incidences of GP consultation and referral to secondary care due to varicella were found as in routine surveillance. The lower varicella-related consultation rate might be linked to more conservative GP consultation behaviour in the Netherlands, and the relatively young age of infection. This is highly relevant for the decision-making process whether or not to introduce universal childhood varicella vaccination in the Netherlands.

1. Introduction

Varicella is a highly contagious disease caused by primary infection with the varicella zoster virus (VZV). Although varicella is generally considered a mild disease, it may lead to serious complications, hospitalisation and sometimes even death [1]. In 2004, the European Working Group on Varicella (EuroVar) recommended varicella vaccination to all healthy children between 12 and 18 months and to all susceptible children before their 13th birthday [2]. In view of the increased severity with age there was also consensus that routine vaccination should be implemented only if a high level of vaccine coverage can be reached over a reasonable period; if not, vaccination of susceptible adolescents was suggested as an alternative option. In Germany, Luxembourg, Latvia, Greece and Cyprus childhood varicella vaccination is already included in the National Immunisation Programme (NIP) and in some other

Abbreviations: CI, Confidence interval; GP, General practitioner; ICPC, International Classification of Primary Care; IPCI, Integrated Primary Care Information; IR, Incidence rate; LMR, National Medical Register; VZV, varicella zoster virus.

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European countries, varicella vaccination is only offered in specific regions, only in the private sector, or only to high-risk groups and/or susceptible adolescents [3–5]. In the Netherlands, vaccination against varicella has not been implemented in the NIP yet.

In the decision-making process whether or not to introduce universal childhood varicella vaccination, insight into the severity and extent of the national disease burden of varicella is essential [6]. In the Netherlands, nearly 100% of the population contract the varicella zoster virus [7]. However, in the context of varicella vaccination and its cost-effectiveness the focus is not necessarily on prevention of varicella but on prevention of severe varicella complications. So on prevention of the more severe varicella patients who need healthcare or die. Patients who do not consult a GP probably experience milder symptoms and do not cause considerable direct healthcare costs. According to routine surveillance data (Appendix 1), the reported number of varicella related general practitioner (GP) consultations, hospital admissions and/or deaths per 100,000 inhabitants in the Netherlands are lower compared with other countries, such as the United States, England and Wales and Germany (pre-vaccine area) [8]. However, a recent Dutch study found an incidence of GP consultations due to varicella in 2004–2008 of 515 per 100,000 [9], almost twice as high as found in the routine surveillance.

With regard to the decision whether or not to introduce universal childhood varicella vaccination in the Netherlands, it is important to have robust estimates of the incidence of varicella-related consultations in healthcare to validate the lower estimates obtained through routine surveillance. Therefore, we performed a retrospective cohort study in the dynamic population of the Integrated Primary Care Information (IPCI) database to investigate the incidence of GP-consultations, referral to specialists, contacts with emergency departments and hospitalisations due to varicella.

2. Materials and methods

2.1. Setting

The IPCI database is a longitudinal GP research database from the Erasmus University Medical Center, Rotterdam for which data collection started in 1996. The electronic database presently contains over 1 million patient records from more than 400 GPs in the Netherlands [10–12]. The IPCI database contains comprehensive information on the medical history of patients, including referral to secondary healthcare. The medical records of patients in IPCI are anonymised and contain information on demographics, signs and symptoms, diagnoses (using the International Classification of Primary Care (ICPC) codes), clinical findings, laboratory test results, drug prescriptions, referral to specialists and hospitalisation. Summaries of letters from specialists and hospital discharge letters are also included within free text fields and a hard copy of the original letter can be provided upon request. The patient population is nationally representative by sex and age, except for a slight under representation of the elderly population moving to nursing homes. IPCI complies with European Union guidelines on the secondary use of healthcare data for medical research and has been proven valid for pharmaco-epidemiological research. Guidelines on good pharmaco-epidemiological research are rigorously followed by all researchers working on the IPCI database. The use of IPCI data for the current study was approved by the Scientific and Ethical Advisory Group of the IPCI database (project number 07/44).

2.2. Study population

The total study population for the current study comprised all persons with a patient record in the IPCI database in the period between January 2006 and December 2008. All persons had at least 1 year of valid database history, which means that the GP practice contributed data to the IPCI database for at least 1 year and the patient had been registered with the GP for at least 1 year. Follow up ended on the date the person transferred out of the practice, on the date of last data supply by the GP, the date of death, the date of varicella diagnosis (or first onset of symptoms) or 31 December 2008 at latest.

2.3. Methods

Varicella cases in IPCI were identified according to the following procedure: all patients with diagnosis ICPC-code A72 (=varicella/chickenpox) and all patients with chickenpox (Dutch: 'waterpokken'), varicella or VZV in the free text fields in the medical journal were considered to be potential varicella cases. Subsequently, all these patients were manually reviewed by (bio)medical students and categorised as 'varicella' or 'probable varicella' cases (if the GP was not sure of the diagnosis).

For all (probable) varicella cases additional medical information related to varicella was collected from the medical journal text:

- ICPC-code.
- Number and type of GP visits (consultation at GP practice, telephone consultation, GP visit at home, consultation at central GP point outside normal working hours).
- Prescription of medication.
- Complications.
- Referral to secondary healthcare (specialist, emergency department or hospital admission).

If the type of GP visit was not specified, we chose for a consultation at the GP practice, because this was the most common consult type. Possible complications of varicella were included if they occurred within 4 weeks of the date of first symptom onset (or if not available the diagnosis date). In cases of doubt, a medical doctor reviewed the possible complication indicated by the (bio)medical student to judge if it was likely to be caused by varicella.

For varicella patients ($n = 54$) that were referred to a specialist, emergency department or admitted in a hospital, a short questionnaire was sent to the GP in order to confirm the (date of) varicella diagnosis, the (main reason for the) referral to a specialist, emergency department or hospital admission and complications due to varicella; for 12 of these 54 patients it was not possible anymore to contact the GP. Additionally, for this subgroup of patients anonymous copies of specialist and hospital discharge letters were collected to verify if the collected information based on the electronic patient record was correct and complete.

2.4. Data analysis

Incidence rates (IR) of GP consultation, specialist referral, emergency department contact and hospitalisation due to varicella were calculated by dividing the total number of varicella cases by the total number of person-years within the study population. IRs and 95% confidence intervals (CI) were calculated by calendar year, sex and age. For the incidence of GP consultation, we calculated a *minimum* IR in which only varicella cases were included and also a *maximum* IR in which all probable cases were included as well (see also Fig. 1). Additionally, all IRs were standardised (direct standardisation) by sex and age to the mean Dutch population in the period 2006–2008 to be able to compare our results with routine surveillance data. IRs were calculated by using Jerboa© software (developed by the Erasmus University Medical Center, Rotterdam).