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Brief report

Decline of varicella vaccination in German surveillance regions after recommendation of separate first-dose vaccination for varicella and measles–mumps–rubella

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ABSTRACT

Background: Germany introduced routine varicella (V) vaccination in 2004. Due to a slightly increased risk of febrile convulsions after first-dose application of combined measles–mumps–rubella–varicella (MMRV) vaccine separate first-dose vaccinations with MMR and monovalent V vaccine were recommended in September 2011.
Methods: We compared V and MMR vaccinations in paediatric practices from two surveillance regions (Munich and Würzburg) one year before and after the change in the recommendation.
Results: A total of 1405/326 monthly reports were provided by a monthly average of 79/14 practices participating in Munich/Würzburg. V first-dose vaccinations (monovalent V or MMRV vaccine) declined by 12% in Munich (from 10.1 to 8.9 vaccinations per month and practice; $p < 0.005$) and by 4% in Würzburg (from 9.9 to 9.5; $p = 0.620$), respectively. First-dose vaccinations for MMR (MMR or MMRV vaccine) did not change significantly in both regions.
Conclusion: Acceptance of V vaccination depends in part on the use of combination vaccine.

1. Introduction

The German Advisory Committee on Vaccinations (STIKO) recommended routine varicella (V) vaccination for all children in 2004, with one dose at 11–14 months of age [1]. In July 2009, a two-dose schedule was recommended, with a second dose to be applied preferentially at 15–23 months of age, and for older children vaccinated only once [2]. In 2004, two trademarks of monovalent V vaccine were available in Germany [3]. A combined measles–mumps–rubella–varicella (MMRV) vaccine was available in 2006 but not generally reimbursed until 2009. MMR vaccination is already well accepted in Germany [4]; as the vaccination schedule for V was aligned with the MMR vaccination schedule, MMR uptake (either as MMR or MMRV) provides an estimate for V vaccination compliance.

After initial increase, first-dose V vaccination coverage in children up to 3 years of age had stagnated in the German Federal State of Bavaria at a level of about 50% during the period 2007–2009 [3]. Since 2009, the MMRV vaccine was increasingly used (in 86% of all first-dose vaccinations in 2011) [4], and first-dose coverage increased to 70–80% in Bavaria [4] and other German regions [5] until 2011.

However, compared to concomitant application of measles–mumps–rubella (MMR) and monovalent V vaccine at different injection sites, MMRV vaccines have been associated with a slightly increased risk of febrile seizures (approximately one additional febrile seizure per 2300 first-dose MMRV vaccinations) at a period of 5–12 days after first-dose vaccination, both for the MMRV vaccine used in the USA and for the one used in Germany [6,7]. Hence, the US Advisory Committee on Immunization Practices and the STIKO recommended concomitant but separate first dose vaccination for MMR and V in 2010 [6] and 2011 [7], respectively. For the use of MMRV in second-dose vaccinations the recommendations did not change, as no increased risk of febrile seizures had been observed.

We compared the frequency of vaccinations against V and MMR in paediatric practices during the year before and after the STIKO 2011 recommendation, within the frame of long-term regional surveillance in two regions of Bavaria (Bavarian Varicella Surveillance Project, BaVariPro [4]).

2. Methods

Paediatric practice surveillance was conducted in the area of Munich (MU; inhabited by 34,182 children <2 years of age in 2010

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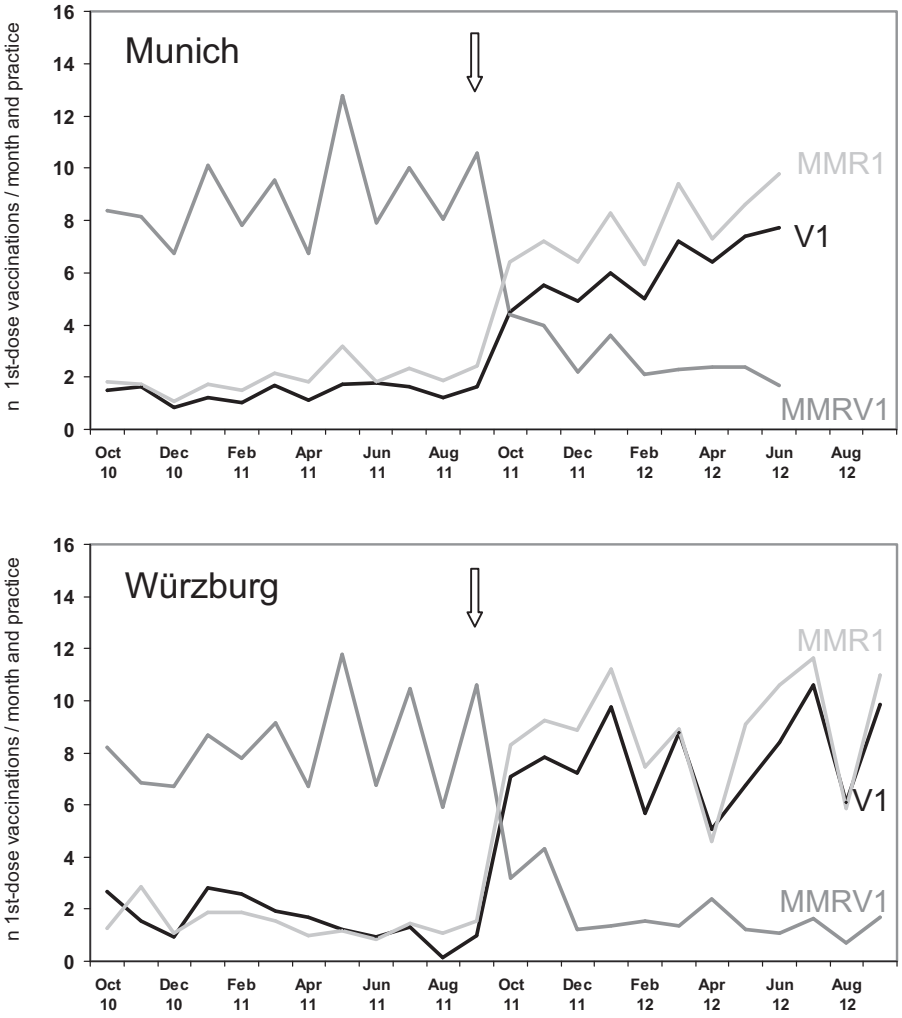

Fig. 1. First-dose vaccinations against varicella (V) and measles–mumps–rubella (MMR) in paediatric practices, monthly average by vaccine type and dose. Frequency of first-dose monovalent V vaccinations, combined MMRV vaccinations, and MMR vaccinations in paediatric practices in Munich and Würzburg; average numbers per month and practice from monthly reports, before and after the STIKO 2011-recommendation (indicated by the arrow) for separate V and MMR first-dose vaccination.

[8]) and of Würzburg (WÜ; inhabitated by 4515 children <2 years of age in 2010 [8]), from October 2010 to June 2011 (MU) and to September 2012 (WÜ), respectively. Practices provided monthly reports on the number and dose of V and MMR vaccinations, on the vaccine type used (monovalent V, MMR, or MMRV vaccine), on the age distribution of the vaccinated children (<2/2–9/10–16 years of age), and on the number of V cases [4].

Data were entered into a Microsoft Access 2003 database and transferred into SPSS 20.0 for statistical analysis. Comparable observation periods before and after the STIKO recommendation (September 2011) were selected for analysis (for MU: October 2010 to June 2011 and October 2011 to June 2012; for WÜ: October 2010 to September 2011 and October 2011 to September 2012). Data for each period were provided as average per practice and month (PM) with standard error of the mean (SE). Comparisons across subgroups were assessed using the Mann–Whitney *U*-test, with a level of significance of 0.05.

BaVariPro was approved by the Bavarian Data Protection Office and the University Ethics Committees of Munich and of Würzburg.

3. Results

In the MU area, on average 79 (60% of all) paediatric practices participated each month and provided a total of 1405 monthly reports (713 from October 2010 to June 2011 and 692 from October 2011 to June 2012). In the WÜ area, on average 14 (74% of all) practices provided a total of 326 monthly reports (170 from October 2010 to September 2011 and 156 from October 2011 to September 2012). A total of 13,314/3149 first-dose V vaccinations, 15,807/3750 second-dose V vaccinations and 2167/278 V cases were reported from MU and WÜ, respectively.

In both regions, first-dose combined MMRV vaccinations decreased rapidly after the STIKO 2011 recommendation (Fig. 1), from an average of 8.7 (MU)/8.3 (WÜ) vaccinations per PM to 2.8 (MU)/1.8 (WÜ) vaccinations (Table 1). In contrast, first-dose monovalent V vaccinations increased from a monthly average of 1.4 (MU)/1.6 (WÜ) to 6.1 (MU)/7.8 (WÜ) (Table 1). First-dose separate MMR vaccinations increased as well, from a monthly average of 1.9 (MU) and 1.5 (WÜ) to 7.7 (MU) and 8.9 (WÜ) (Table 1). Overall, first-dose vaccinations against V (by either V or MMRV vaccine) decreased by 12% in MU (from an average of 10.1–8.9 vaccinations, $p = 0.005$) and by 4% in WÜ (from an average of 9.9–9.5 vaccinations; $p = 0.620$), respectively (Table 1). Overall, second-dose vaccinations against V (by either V or MMRV vaccine) decreased by 19% in MU ($p < 0.001$) and by 15% in WÜ ($p = 0.108$; Table 1). Subgroup analyses of practices participating during all months of observation (95% in MU and 87% in WÜ, respectively) confirmed the main results, as well as a subgroup analysis on the WÜ data restricted to the observation periods from October to June.