Primary immunization according to STIKO recommendations among children with congenital heart disease

Wacker-Gussmann A¹, Unterleitner C¹, Becker R¹, Remmele J¹, Reiner B¹, Hock J¹, Nagdyman N², Ewert P², Oberhoffer R¹

¹Institute of Preventive Pediatrics, Faculty of Sport and Health Sciences, Munich, Germany

²German Heart Centre, Department of Pediatric Cardiology and Congenital Heart Defects, Munich, Germany

The first two authors equally contributed to the manuscript

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Conclusions

Children with congenital heart disease show inadequate immunization rates, both individually and compared to healthy children.

Background and Objectives

The Standing Committee on Immunisation (STIKO) recommends a standard vaccination program for children in Germany. For special subgroups, like children with congenital heart disease, even higher recommendation levels occur. However, little is known about the vaccination status of this patient group.

Patients and Methods

Children with congenital heart disease aged between 2 and 17 years were enrolled in a prospective study at the German Heart Center Munich, Germany. Vaccination and medical status were received by a specific questionnaire and patient survey. Excel and R were used for statistical analysis. Results were referred to the STIKO recommendations 2014.

Results

Vaccination recommendations

The STIKO recommendations of 2014 were valid for all children. (figure 1). The general recommendation for pneumococci was added in 2006, for varicella in 2004. However, for children with congenital heart disease, pneumococci and varicella were already recommended in 2001, so all children enrolled in this study should be vaccinated according to this scheme.

Complete primary vaccination rates

657 children with a mean age of 9.8 (SD+/- 4.8) years were enrolled in the study. Out of these, 44 (6.6 %) had completed all primary vaccinations within the recommended time frame and 221 (33.6 %) within the maximum admissible time frame (figure 2). Low immunization rates for pneumococci, meningococci, hepatitis B and varicella led to the low coverage (figure 6).

vaccine	age in months					age in years			
	2	3	4	11-14	15-23	2-4	5-6	7-17	
tetanus	P1	P2	P3	P4	C				
diphtheriae	P1	P2	P3	P4	C				
pertussis	P1	P2	P3	P4	C				
polio	P1	P2	P3	P4	C				
h.influenzae b	P1	P2	P3	P4	C				
hepatitis b	P1	(P2)	P3	P4	C				
mumps/measles/rubella				P1	P2	C			
varicella				P1	P2	C			
meningococci C				P1	C				
pneumococci	P1	P2	P3	P4	C				

figure 1: STIKO vaccination recommendations of 2014. P = primary immunisation dose; C = catch up intervall. Light grey = recommended time frame for primary immunization; grey = maximum admissible time frame for primary immunization

figure 2: Percentage of children with congenital heart disease who had completed all STIKO recommended vaccinations.

figure 6: vaccination rates of children with congenital heart disease and the average children entering school

figure 3: counseling regarding vaccination relating to the responsible physician.

figure 4: vaccination rates depending on physicians' advice

Primary vaccination rates correlated to responsible physician and physicians' advice

One third received an explicit vaccination recommendation from their physician, 60% got at least active counseling. Pediatricians and general practitioners were partly unsure about vaccinating children with congenital heart disease. A few pediatricians even advised against vaccination (figure 3). However, the overall vaccination rates were independent from the physicians' advice (figure 4), but significantly lowest for children consulting a general practitioner (figure 5).

figure 5: vaccination rates depending on the responsible physician