

AGE SPECIFIC VACCINATIONS IN HUNGARY

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Age specific vaccinations in Hungary are free and compulsory for all children traditionally for decades. The current "vaccination calendar" covers 10 vaccine preventable infections (tuberculosis, polio, Hib, diphtheria, pertussis, tetanus, morbilli, mumps, rubella, Hepatitis B), a yearly birth cohort <100 000 newborns. The costs are covered entirely by the budget, whereas all other vaccines registered get variable financial support (100-30%) depending on age and risk status. Vaccinations are carried out by primary care paediatricians (coverage rate ≈100%). Exemptions are only for medical reasons, and should always be supported by one of the vaccination consultation services, available in each of the 19 county hospitals (center at the Municipal Hospital for Infectious Diseases, Budapest). The lecture deals with the recent changes in local epidemiology of infections presently covered by the calendar, and also with those, where though vaccines are available, universal use in children is yet an open question (Hepatitis A, varicella-zoster, influenza, meningococcus C and pneumococcal infections, tick borne encephalitis). The international trends of combined vaccines as well as the problem of acellular versus whole cell pertussis vaccines are also mentioned. Anti vaccination movements have already reached Hungary as well, and the difficult issue of dealing with them is commented finally.

Introduction

Active immunization is clearly the most successful and cost-effective way of preventing infectious diseases worldwide. The benefits of mass vaccination programs are generally accepted. Both the government and the medical profession advocate vaccination of babies from the age of two months. Mass vaccination has been largely responsible for the declines in the incidence of the so called "traditionally childhood infectious diseases" like whooping cough, tetanus, diphtheria, polio, etc. Hungary has for decades back achieved remarkably high coverage rates and the "Vaccination calendar" has always been one of the best within Europe despite the moderate financial sources - similarly to all neighboring countries. The effectivity of this

program can be verified if the morbidity data, found by the various surveillance systems (Vaccine preventable disease surveillance, laboratory based surveillance), are reviewed.

This is testimony to the efforts of the primary care paediatricians, general practitioners and field nurses who have actively implemented and promoted the government's strategy to maintain high childhood immunization rates, performing and executing the official guidelines published and yearly revisited by the National Vaccination Committee of the national Institute of Epidemiology (Table 1 and 2). All childhood, age related vaccinations are free and compulsory by law (Table 3) at the same time, financed entirely by the national budget. Exemptions to vaccinations are done strictly on medical grounds, and should always be supported by the vaccinologist - a specially trained paediatrician, who works at one of the Vaccination Consultation Services, available in all 19 counties and in Budapest at Szent Laszlo Hospital. Primary care paediatricians and all other physicians are free to recommend any registered vaccine outside the "Calendar",

but generally only the paediatricians do. Unfortunately vaccination is generally regarded as a "childhood" issue in the perception of others, regardless of their medical or other education, whereas practically all vaccines generally available in other countries are on the free market. Great efforts are done to help the yearly implemented flue vaccine campaigns for the populations at risks, and over 1 million dose of flue vaccine is offered free for those involved.

The Hungarian Immunization Schedule - The "Vaccination Calendar"

Hungary has a population of about 10 million people, with an annual birthrate (live births) of somewhat over 90 000. Unfortunately there is a tendency of slow decline for both figures for the last decade. The relatively high infant mortality rate - 7.3/1000 live births - is mainly attributable to the high preterm rate (8.7 % of all live births). Presently in Hungary all children are vaccinated against the ten vaccines preventable infections (WHO recommendations) according to an age specific schedule (Table 1).

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Table 1
Age specific vaccinations, Hungary

Vaccination calendar, 2005.		
vaccine	age	remark
Continuous vaccinations		
BCG	0-6 week	Generally at the institute/clinic the child is delivered
Hib	2 mo	
DwPT I/a + IPV	3 mo	
DwPT I/b + OPV	4 mo	
DwPT I/c + OPV	5 mo	
MMR + OPV + Hib II	15 mo	
DwPT II + OPV	3 y	
DwPT III + OPV	6 y	
Vaccinations at school		
dt	11 y	In September (VI. class, elementary school)
MMR revaccination	11 y	In October (VI. class, elementary school)
Hepatitis B	14 y	1st dose in September (VIII. class, elementary school)

BCG: Bacillus Calmette Guerin
 Hib: Haemophilus influenzae b
 DwPT: Diphtheria - Pertussis(whole cell) - Tetanus
 dt: diphtheria - tetanus
 IPV: Inactivated Polio Vaccine
 OPV: Oral Polio vaccine
 MMR: Measels - Mumps - Rubella

As seen on Table 1, all children are vaccinated against tuberculosis at birth, generally at the maternity hospital. Practically all deliveries are at the maternity wards, though recently a new concern evoked: very small number of people - generally those, who reject all health care and other offered help or interventions and plan to live "naturally" - deliver their babies at home. These babies might miss not only BCG, but also the routinely performed screenings for inborn errors of metabolism (phenylketonuria, galactose, biotinidase deficiency and hypothyroidism).

Due to the overall screening for over 30 years, paediatricians practically know about these disorders only from textbooks. The booster doses of BCG are not given since 2002, as data showed without any further doubt, that the slowly, but continuously increasing tuberculosis morbidity in early adulthood cannot be prevented by them. We are convinced nevertheless of the effectivity of infant

BCG vaccination for the prevention of extra pulmonary tuberculosis manifestations (meningitis basilaris tuberculosis, miliaris tuberculosis) in early childhood, as these clinical forms are seen extremely rarely, and only in unvaccinated children of homeless or immigrant families. Tuberculosis, as "Morbus Hungaricus" was an infection well known to all physicians after World War II, presently the morbidity is low (27.1% in 2003), though unfortunately in tendency, increasing again.

There is a screening program during pregnancy for HBsAg carrier state of all future mothers (the program has been going on for ten years now), and the babies of the positives get HBV vaccination implemented within 24 hours of delivery. The results of the pregnancy screenings give a rather low general morbidity rate (less than 1% of all are HBsAg carriers), so this justifies our approach to HBV vaccination: instead of universal infant vaccination we implement the HBV doses to teenagers, at the age of 14 y. It can

be argued, whether universal infant + teenage HBV vaccination would or would not be worthwhile, beneficial, or cost effective in our settings - opinion of the experts (The National Vaccination Committee, established in 2002) is somewhat divided. My opinion is for universal HBV vaccination, because therefore we could exclusively diminish Hepatitis B infection from a generation to come - presently HBV age specific morbidity is extremely low, though cases do occur with the well known consequences.

Hib vaccination (introduced in 1996) started at two months has practically eradicated Hib disease and epiglottitis from Hungary, what we all feel is something to be contented with. As the cases of Hib meningitis have decreased, the public concern of the well known pain reaction following the first dose has started to evolve, creating again a new challenge: the disappearance of a threat, e.g. the meningitis with all sequelae, etc - and the overestimation of the pain, the high pitched crying after administration of the vaccine.

It remains to be seen, whether we shall have the same experience, when we shall be able to afford the newer combination vaccines, e.g. when DPT+HIB+IPV is given in one shot. DPT priming is done at three months along with IPV - since 1992 - and due to it we have not had a single vaccination related polio case for the last fourteen years! Prior to this approach, one, seldom two cases were seen - with the awful implication of becoming permanently disabled by a preventive

Table 2
Vaccine coverage by diseases included in the calendar in 2003 in Hungary

DPT I/c + OPV	99.8%
MMR + OPV + Hib II	99.9%
MMR (second dose)	99.7%
Hepatitis B III	99.8%
BCG	100 %

BCG: Bacillus Calmette Guerin
 Hib: Haemophilus influenzae b
 DPT: Diphtheria - Pertussis - Tetanus
 IPV: Inactivated Polio Vaccine
 OPV: Oral Polio vaccine
 MMR: Measels - Mumps - Rubella

Table 3
Legal basis for regulation of vaccines in Hungary

Act 40 of 1995 on Procurements and Tendering Committee
Act 25 of 1998 on Medicines for Human Use
Act 20 of 1951 on Production, Control and Authorisation of Immunological Products
Governmental Decree No. 37/2000 on the Subjective and Objective Conditions of Manufacture of Medicines for Human Use
Decree No. 12/2001 of the Minister of Health on the Registration and Authorisation of Medicinal Products for Human Use
Joint Decree No. 41/1999 of the Minister of Health and the Minister of Agriculture and Regional Development on the Application and Compliance Monitoring of Good Laboratory Practice of Medicines Intended for Human Use and for Pesticides

Concluding remarks

The Hungarian vaccination program is effective and well executed. Our main future goal is to maintain the high coverage rates, to switch, if financially feasible, towards combined vaccines, preferably with IPV and acellular pertussis. There is room for the introduction of new antigens into the program, but the medically desirable is not always financially feasible.

intervention. These unfortunate kids naturally were compensated - though that was of little real value for them.

We have been and are using whole cell pertussis DPT vaccines, without experiencing real side effects or any other complaints, apart from fever, and rather occasionally hypotonic hyoresponsive episodes (HHE). As the babies are at home and the observer of the post vaccination events is generally the inexperienced parent, it is rather difficult to evaluate the possibility of HHE in some cases.

The switch to the acellular pertussis variations is therefore an open and mainly supported issue, even more so, if we consider a certain group of the preterm population, who would benefit evidently from the introduction of a less reactogenic vaccine. The dilemma of the decision is not really medical, rather financial. Our hope is to implement an acellular pertussis penta vaccine into our calendar soon, and by doing that, switching to IPV for the whole calendar - omitting OPV at the same time.

The public hysterics with the morbilli vaccination have already reached our country too - causing several lively, seldom correct discussions on all media levels. Up to now we could nevertheless maintain high coverage, but the "walls are shaking" antivaccination views are popping up every now and then. The high coverage rates of the two MMR doses are verified also by the disappearance of congenital rubella syndrome. The teenage HBV vaccination has already been discussed above - though executed

according to plan, we cannot as yet announce the complete control of paediatric HBV infection.

Vaccines outside the "Calendar"

Vaccination against Hepatitis A is recommended for travelers, and all patients with chronic diseases of the liver regardless of its origin. The infection is sporadic, regionally endemic, especially in the spring, when certain regions suffer of floods. Vaccination against chickenpox is not routinely done, though there is much discussion on its implementation - benefits and hazards. Tick borne encephalitis is well controlled, the total number of cases/year is below 100, but, as there is no antiviral, and the outcome is variable, there is not much dispute about its usefulness. Pneumococcal vaccination of the elderly with the polysaccharid vaccine (23 valent) is one of the most advertised and least followed issues. The conjugated, 7 valent paediatric vaccine has just been registered, and the national, prospective surveillance for its potential benefits are not yet decided.

Meningococcal vaccination is also an option one may choose; generally the vaccinations follow the geographic pattern of a new case along with the public hysteria. Lyssa - human lyssa has not been seen for years back - is well under control by the veterinary network. The introduction of novel future vaccines - likes Rotavirus, or Human papilloma-virus vaccines need - prior epidemiological assessment of disease burden, and careful, professional public communication of the benefits.