Vaccination Age Changing from Infancy and Childhood to Adolescence and Adulthood: An In-Dispensable Approach in Immunization Programs

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Despite the positive effects of vaccines on control of many infectious diseases, they are not completely safe. The purpose of this article is to draw attention to the problems associated with newborns and infants immunization.

For each subject, a review of electronic sources was carried out in the PubMed and Google Scholar using appropriate key words.

For different reasons including: the differences between the immune systems of newborns/children and adults, sever adverse events and inefficacy of vaccines, deceptive advertising and inadequate parental awareness about vaccines and vaccination; newborns and children are at risk and accordingly a decline in public confidence is observed.

The revision of vaccination age changing (at least for some vaccines) in order to maintain newborns/children's health and to prevent the return of infectious diseases is required. To achieve this goal, new retrospective and prospective studies to reassess the safety, efficacy, quality and protection duration of vaccines, proper implementation of good clinical practice, establishment of a network vaccine safety database by collaboration of international organizations, vaccine manufacturers and academic centers for sharing of information and enhancement of awareness of healthcare professionals and people about immunization at global level are needed.

Vaccination age; Immunization; Public conŽdence; AEFI; HBV

HXe aim of vaccination is protection of population against preventable infectious disease. Despite vaccines have contributed in reducing the impact of many infectious diseases, they are not completely safe and can cause adverse ewects. While common side ewects of vaccines are mild, some vaccines have been associated with serious or even deadly side ewects [1]. On the other hand, public conŽdence in vaccines is waning [2-4]. For these reasons, vaccine pharmacovigilance is the centre of attention and is of particular importance to promote both public conŽdence in vaccines and acceptance of immunization programs.

Pharmacovigilance is the science and data gathering activities relating to the detection, assessment and understanding of adverse events and its ultimate goals are: prevention of adverse drug reactions, rational use of pharmaceutical products, enhancement of patient care and patient safety and risk minimization by education of healthcare professionals or patients [5-7]. HXe importance of vaccines pharmacovigilance is related to the vaccines characteristics including: 1) they are biological products (variation in manufacturing process); 2) mandated by governments through national immunization programs; 3) Heat, light and freezing sensitive (need cold chain); 4) administered to healthy individuals and given for prevention; 5) highly expensive with limited shelf life; 6) given once or only a few times; and 7) inducing body immune system for protection [8-11]. HXe purpose of this article is to draw attention to the problems associated with newborns and infants immunization and based on recent researches in the Želd of vaccines and vaccination, hypothesizes the necessity of revision of the vaccination age changing.

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T e di f erences

Meningitidis, Haemophilus influenza). The ability to respond to polysaccharide antigens is developed by 18-24 months of age [13,14].

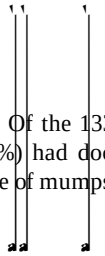
In neonates, the immune response appears to shift from the Th1 to the Th2 profile [12,15]. Also, a decrease in interferon (IFN) production by lymphocytes (and correspondingly hyporesponsiveness of macrophages) and a reduction of Th1 cytokines production such as interleukin 1 (IL-1) and IL-12 by mononuclear phagocytes are observed. Progesterone and IL-10 which are produced by the placenta, down-regulate Th1 response in order to prevent fetus rejection. In addition, signaling of Toll-like receptors (TLR) maybe impaired in children. For example, an insufficient amount of MyD88 (an adaptor protein involved in TLR signaling) was found in children [16,17].

There is a high statistically significant correlation between increasing number of vaccine doses and growing infant mortality rates and the percentage of hospitalizations. Based on a study published in 2009, in spite of the United States (US) spending more per capita on health care, the country (with 6.22 infant deaths per 1000 live birth) ranked 34th in order of infant mortality rate and 33 countries such as Singapore, Iceland, Malta, Czech Republic and Cuba ranked higher than the US. In the first five countries such as Singapore (2.31), Sweden (2.75), Japan (2.79), Iceland (3.23) and France (3.33) only 12 vaccine doses and in the US, 26 vaccine doses are given to infants during the first year of life. High rate of infant mortality have been reported between the ages of 2 to 4 months (the highest rate of vaccination) especially when the first doses of DPT vaccine were given to infants [18,19]. Evaluation of a mathematical model of the 2009 H1N1 influenza pandemic in Mexico in six age groups (0-5 yr, 6-12 yr, 13-19 yr, 20-39 yr, 40-59 yr, ≥ 60 yr) has revealed that the optimal age groups for vaccination against the disease were young adults (20-39 yr) followed by school age children (6-12 yr) [20].

Excipients: 1) A few months after Pandemrix® (the influenza A vaccine containing the AS03 adjuvant) administration following the influenza A (H1N1) epidemic in Europe, more than 800 children across Europe (especially in Sweden and Finland) have been diagnosed with narcolepsy-cataplexy [21]. At present, assessments of the causal mechanisms about the adjuvant remains to be investigated and long term epidemiological studies about AS03-adjuvanted influenza A (H1N1) pandemic vaccine prepared with the European inactivation/ purification protocol are recommended [22].

2) Aluminum adjuvants are neurotoxin and associated with a set of autoimmune/inflammatory disorders [23] and autism [24]. These adjutants should not be used as placebos in clinical trial studies [25].

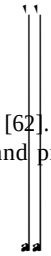
3) Autistic spectrum disorder [26] and psychomotor development deficit [27] have been reported with thimerosal containing vaccines. It was indicated that the instantaneous relative excess mercury that the US children received from vaccines ranged from 11 to 150-fold in comparison to the US Environmental Protection Agency (EPA) safety guidelines and 2.7 to 37-fold in comparison to the US Food and Drug Administration (FDA) safety guidelines for the oral ingestion of methylmercury at a given age [28]. Nevertheless, the World Health Organization (WHO) and the US Centers for Disease Control and Prevention (CDC) emphasize the safety of thimerosal aM pn



US. Of the 133 patients with investigated vaccine history in Iowa, 87 (65%) had documentation of receiving two doses and 19 (14%) one dose of mumps-containing vaccine [41].

The FDA recommended suspension in the use of Rotarix® due to contamination with porcine circovirus 1 (PCV1) DNA [42]. Victoria et

nutrition [61] and occupation [62]. As can be seen, various cofactors are involved in development and progression of cervical cancer after primary HPV infection.



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