

The historical evolution of the Brazilian children's immunization schedule

A evolução histórica do calendário vacinal brasileiro infantil

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ABSTRACT

Preventively, vaccines are proposed after diseases that compromise public health and lead to death. The aim of this study is to present the evolution of the children's immunization schedule in Brazil. It is an integrative review of the literature, in the databases LILACS, MEDLINE and SciELO, using the temporal cut-off from 1956 to 2017. There is a shortage of publications on the subject. The first children's immunization schedule dates back to 50, when common diseases were smallpox, yellow fever and tuberculosis. This has undergone constant transformations in favor of the population. In Brazil we have compulsory notification allied to vaccination with the quantification of patients to propose any modification in the schedule. It is concluded that the health professional must know the history of the children's vaccination schedule, the requirements and components of the vaccines to understand the contemporaneity of its action. The National Immunization Program is costly in terms of its maintenance. Vaccines against Dengue and Zika virus are in the testing phase and are not expected to enter the schedule.

Keywords: Immunization; Public Health; Health Centers; History.

RESUMO

De forma preventiva, as vacinas são propostas após doenças que comprometem a saúde pública e levam as pessoas a óbito. Objetiva-se apresentar a evolução do calendário vacinal infantil no Brasil. Trata-se de uma revisão integrativa da literatura, nas bases de dados LILACS, MEDLINE e SciELO, utilizando o recorte temporal de 1956 a 2017. Há escassez de publicações relativas ao tema. O primeiro calendário vacinal infantil data de 50, época em que as doenças comuns eram a varíola, febre amarela e tuberculose. Este sofreu transformações constantes em prol da população. No Brasil tem-se a notificação compulsória aliada a vacinação com a quantificação de doentes para propor qualquer modificação no calendário. Conclui-se que o profissional de saúde deve conhecer a história do calendário vacinal, os requisitos e componentes das vacinas para compreender a contemporaneidade de sua atuação. O Programa Nacional de Imunização é custoso no que tange a sua manutenção. As vacinas contra a Dengue e Zika vírus estão em fase de testes e sem previsão de entrada no calendário.

Palavras-chave: Vacinação; Saúde Pública; Centros de Saúde; História.

NOTE

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INTRODUCTION

Vaccine is a pharmaceutical product consisting of several biological and chemical components, and contains one or more agents (monovalent or combined). With modified and/or purified components of disease-causing micro-organisms, whether viruses, bacteria or fractions; cells culture used in the vaccine production process; proteins; immunizing agents; preservatives and/or antibiotics; liquid suspension; adjuvants and stabilizers⁽¹⁾.

The children's immunization schedule was proposed in Brazil in 1950, where the diseases prevalence such as yellow fever (YF), tuberculosis (TB) and smallpox were exorbitant, causing many deaths, so Oswaldo Cruz created the Sanitation Program in the city of Rio de Janeiro⁽²⁾.

The National Immunization Program (NIP) was proposed in 1973 to control and eradicate immunopreventable diseases through mass coverage of the healthy population with vaccines, aiming at immunization⁽¹⁾.

Thereafter, the evolution of the childhood vaccination schedule in Brazil has gradually occurred by the competent agencies and, through the dedication of a set of committed professionals with public health in the promotion and prevention of diseases.

The nurse that works in Collective Health must know the vaccines history, as well as their importance, performance and results of vaccination campaigns related to technical and operational aspects, since it incurs the responsibility to maintain the vaccination coverage pattern of the population assisted by it⁽³⁾.

In view of these questions, the research objective was to present the evolution of the childhood vaccination calendar in Brazil as a public health strategy, from its creation to the present day.

METHOD

The scientific methodology used in this research was the descriptive, integrative review and documentary research, through manuals and printed material from the Ministry of Health (MH), for a historical analysis. The survey was carried out in textbooks and in a virtual environment by the Latin American and Caribbean Literature in Health Sciences (LILACS), Medical Literature Analysis and Retrieval System Online (MEDLINE) and Scientific Electronic Library Online (SciELO), with the following descriptors: "history"; "public health"; "health centers", through the Boolean connector "AND", with the descriptor "vaccination".

The inclusion criteria used include: publication in the temporal cut-off from 1956 to 2017, as this is a historical vaccines review; provision of full text; in Portuguese, English and Spanish; validation studies; in the formats of articles and dissertations; that approached the issue vaccines, congregating its emergence in Brazil and the creation of the first calendar up to the present time.

RESULTS AND DISCUSSION

The materials collection, which covered the period from February 1, 15 to January 30, 17, totaled 30 references, being: 07 articles, 05 books and 18 MH documents.

For the discussion presentation, three categories were elaborated: Vaccination, Evolution of the Brazilian infant vaccination calendar and Brazilian infant vaccination calendar.

1st Category: Vaccination

Vaccination is one of the measures to prevent and protect against various micro-organisms that cause serious illness, affecting human health and leading to death. After receiving the vaccine dose, the vaccinated person produces antibodies against specific antigens, being immune to reinfection by the data agents⁽⁴⁻⁵⁾.

2nd Category: Evolution of the Brazilian children's vaccination calendar

In 1796, British scientist Edward Jenner discovered the first vaccine obtained from cowpox lesions material, being introduced to the first generation, two years later⁽⁶⁻⁷⁾.

In 1804, the introduction of the smallpox vaccine occurred in Brazil, due to the transmissible diseases brought by the Portuguese and later by foreigners and African slaves by immigration⁽⁷⁻⁸⁾.

In 1885, the anti-rabies vaccine developed, scientifically developed in the laboratory of Dr. Louis Pasteur, Paris, France⁽³⁻⁹⁾.

In 1897 yellow fever and malaria epidemics occur in Brazil, with a mortality impact on the cities, causing damage to trade and hampering the capitalism expansion. Brazil stood out ahead, through health campaigns with results of epidemic control⁽⁴⁻⁷⁾.

In 1904 the first vaccines against smallpox were introduced by the Marquis of Barbacena in Brazil, where Law No. 1,261 establishes the obligatory nature of vaccination, elaborated and directed by Oswaldo Cruz⁽⁷⁾.

In 1906 the bacillus of Calmette and Guérin (BCG) was developed in France by Calmette and Guérin, with the discovery of the Mycobacterium bovis strain. Yellow fever kills four thousand immigrants in Brazil from 1897 to 1906. Forty-eight deaths from yellow fever were recorded in 1906⁽⁷⁾.

In 1923 BCG was indicated subcutaneously in the world in the test phase. In Brazil, the BCG vaccine is standardized in 1925 against Tuberculosis, subsequently in 1937, the manufacture of the vaccine against yellow fever⁽⁷⁻⁸⁾.

The first national smallpox campaign was conducted in 1962, through mobilization of local resources and organization of vaccination operations in several states⁽⁴⁾. After this campaign, in 1964, the measles vaccine was introduced⁽⁷⁻¹⁰⁾.

It began in 1967, the vaccine against mumps by single dose between 8 months and 4 years of age⁽⁷⁻¹¹⁾.

Later, in 1968, he gradually inaugurated the use of the BCG vaccine in Brazil by intradermal administration. The first MH vaccination scheme was proposed⁽⁷⁾.

The National Immunization Program (NIP), for the promotion and control of poliomyelitis, tuberculosis, tetanus, diphtheria, pertussis, measles and the conservation of smallpox eradication, was proposed by the Ministry of Health. Campaigns against measles continued in urban areas in Brazil, with no investigation of reported cases⁽⁷⁾.

In 1979, the first cold store manual was published: "The Vaccine Preservation Cooler". Between 1981 and 1986, there was a drop in vaccine coverage due to problems with the composition of the vaccine, with a new epidemic⁽⁷⁾.

In the early 1980s, the human rotavirus vaccine of animal origin first generation (bovine and simian) was developed. Eleven Latin American countries, including Brazil, participated in the vaccine studies, with infants being studied between 6 and 13 weeks⁽¹²⁾.

The creation of the symbolic brand in Brazil "Zé Gotinha" happened in 1986, linked to the campaign for the eradication of poliomyelitis with the publication of the document "The mark of a commitment"⁽⁷⁻¹¹⁾.

In the history of the NIP, two very important implantations took place: the Technical Advisory Committee on Immunizations (TACI) in 1991, and the Reference Center for Special Immunobiology (RCSI). Since 1993, the RCSIs are free publicly available vaccination units by prescription, and offer special products to individuals who require special immunobiologicals for some reason⁽¹⁾.

In 1992, with the implementation of the Epidemiological Surveillance System in Post-Vaccine Adverse Events and the national vaccination campaign under the age of 15, the Measles Elimination Plan⁽⁴⁻¹³⁻¹⁴⁾.

The NIP received the PAHO Immunization Award as an international recognition for the investments and results obtained, given by the Pan American Health Organization; Award of Recognition by the Brazilian Society of Pediatrics (BSP); and medal of Merit of the Oswaldo Cruz Foundation (Fiocruz).

In 2002, the tetravalent vaccine against diphtheria, tetanus and pertussis (DTP) associated with Haemophilus influenzae type B-Hib vaccine (DTP + Hib) was introduced for children under 1 year-old⁽¹⁰⁻¹⁵⁻¹⁶⁾.

In 2003, the Ministry of Health coordinates preventive measures for immunopreventable diseases, including anti-pneumococcal and anti-influenza, recommended by the World Health Organization (WHO) in the population over 60⁽⁷⁾.

Three years later, in 2006, the oral vaccine against human rotavirus in two doses was included in the basic vaccination schedule and the DTP vaccine became tetravalent, immunized against 4 types of antigens (DTP + Hib), and the vaccine against SCR is applied in two doses⁽¹²⁻¹⁷⁾.

Between 2009-2010, vaccines were included: against pneumococcal infections (Pneumococcal 10-valent), meningococcal conjugate C (Meningococcal C), against hepatitis A and varicella, as well as the vaccine against human papillomavirus (HPV) only for girls, creating a new vaccine calendar⁽¹⁶⁻¹⁸⁻¹⁹⁻²⁰⁾.

In 2011, influenza vaccination was expanded for children aged 6 months to 2 years, pregnant women, health workers, indigenous people, as well as the elderly aged 60 and over, with new proposals and exclusion of some doses of vaccines from the previous one, such as chickenpox and hepatitis A, given the unfeasibility of costs at the time⁽⁵⁻¹⁹⁾.

Following WHO guidelines, in August 2012, Brazil implemented a new vaccination scheme, instituting the inactivated polio vaccine (VIP), in a sequential schedule with two doses at 2 and 4 months and two doses of VOP sequentially, including pentavalent conjugate vaccine, which includes DTP + Hib associated with hepatitis B, and a new calendar is proposed this year⁽⁵⁻¹⁹⁾.

Ordinance No. 1,498/2013 redefined the National Vaccination Calendar, the National Vaccination Calendar of Indigenous Peoples and the National Vaccination Campaigns, revoking Ordinances No. 1,946/2010 and No. 3,318/2010. In addition to the changes described above, MS through NIP expanded the Basic Childhood Vaccination Calendar with the introduction of the Tetra viral vaccine, which made it possible to avoid complications, severe cases and deaths from varicella in the target group of vaccination, and measles, mumps and rubella prevention⁽⁵⁻¹⁹⁾.

In September 2013, the maximum age for application of doses of the human rotavirus vaccine was changed due to operational and endemic aspects. NIP used the monovalent rotavirus vaccine, effective in preventing G1 rotavirus disease, but studies have shown cross-protection for severe gastroenteritis caused by other non-G1 strains, rather than G2, G3, G4, and G9 strains. Thus, age was changed in the new schedule, to achieve prevention by other strains⁽⁵⁻²¹⁾.

In July 2013, it was announced the incorporation of the HPV vaccine in the NIP to the adolescents, as a strategy of public health, aiming to reinforce the current actions of prevention of cervical cancer. In March 2014, doses of the human papillomavirus vaccine were started for girls aged 11 to 13 years, with three doses, with a vaccination schedule of 0, 6 and 60 months.

From July 2014 onwards, the hepatitis A vaccine was introduced by the MH through the NIP, which is applied at 15 months, and can be applied up to 23 months, and considered of great importance since there are no specific anti-viral drugs against the disease. For this reason, the NIP introduced the vaccine adsorbed hepatitis A (inactivated) for children of 12 months, in order to protect them, optimizing the calendar before 2013⁽¹⁹⁾.

Also in 2014, due to the epidemiological situation of whooping cough and the need to protect the mother-

child binomial against the disease, it was incorporated into the National Vaccination Calendar for pregnant women and health professionals attending newborns in the maternities and Neonatal Intensive Care Units (NICUs), diphtheria tetanus vaccine and acellular pertussis (dTpa). The introduction of this vaccine aims to induce the production of antibodies against pertussis in the pregnant woman, and with this the transplanted of the antibodies to the fetus, with protection of the newborn in the first months⁽¹⁹⁻²²⁾.

3rd Category: Current Brazilian Childhood Vaccine Calendar

In 2015, the HPV vaccine supply was increased for girls in the age group of nine to 11 years. The vaccine was also distributed to women aged 14 to 26 who were diagnosed as having the HIV virus. Due to the complications resulting from HPV in this population, the vaccine was incorporated and a new⁽²⁰⁻²²⁾.

In 2016, following the definitions of Resolution WHA68.3, the MH presented the "Global Polio Eradication Plan: Strategy in Brazil". This document considers the objectives of the Strategic Plan for the Eradication of Poliomyelitis (2013-2018). In view of these objectives, countries should replace oral trivalent oral vaccine with bivalent oral. At this time, the vaccination schedule comprises 3 doses of VIP, that is, the third dose that was previously performed with VOP was replaced by VIP, and the two ribs were maintained with oral polio vaccine at 15 and 4 months⁽²²⁾.

As of January 2017, HPV vaccination was available for adolescents between 12 and 13 years old, vaccination is in the routine of the National Vaccination Calendar of the UHS, the vaccination schedule for the boys against HPV is two doses, with six months of interval between them. For those living with HIV, the age range is wider (9 to 26 years) and the vaccination schedule is three doses (interval of 0, 2 and 6 months). In the case of people with HIV, it is necessary to present a medical prescription⁽²⁰⁻²²⁾.

The MH still in 2017, began to make available the meningococcal C conjugate vaccine for adolescents 12 to 13 years old. The age range will be gradually increased until 2020, when children and adolescents between 9 and 13 years old will be included, the calendar was prepared for launch in July 2017⁽²⁰⁻²²⁾.

The NIP has been getting a series of achievements in its existence years, in order to eradicate the autochthonous circulation of wild poliovirus; elimination of the autochthonous rubella virus circulation; drastic reduction of the major immunopreventable diseases incidence, such as: measles, diphtheria, tetanus, pertussis and rotavirus diarrhea and, more recently, meningitis and pneumonia. And in a short time it is believed that the vaccination against dengue will be a truth, at the moment, the control against the mosquito is by health education, very focused on the control and elimination of the outbreaks of the vector. It is

in an advanced stage of research, a vaccine against the four serotypes of Dengue which means a great advance for the control of this disease⁽²⁰⁻²²⁾.

CONCLUSION

This analysis of historical review extended concepts about the evolution of the childhood vaccination calendar in Brazil, which occurred gradually in 49 years.

Many advances have occurred with the eradication of some diseases, as well as population awareness of the vaccination importance, however, there are limitations when considering some side effects that vaccines can cause, and psychological damage in some individuals, even today, still have prejudice against vaccines.

There are few national publications on the subject, however, those cited in this study have supplied the need for what was proposed to investigate.

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