

PREVENTIVE EXAMINATIONS OF CHILDREN IN DIFFERENT COUNTRIES: SIMILARITIES AND DIFFERENCES

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ABSTRACT

The aim: The aim of this study was to compare, analyze and establish differences the recommendations for well-child visits and screenings till the age of 5 years in different countries.

Materials and methods: The comparative analysis of the data from governmental recommendations for pediatricians from Germany, Ukraine and Poland is conducted. It was used the guideline for medical care for a child under 3 years (The Order №149) and for a healthy child from 4 to 18 years (The Order №434) in Ukraine, the book «Kinderuntersuchungsheft» in Germany and child's examination book «Książeczka zdrowia dziecka» in Poland.

Results: The number of visits to children by the doctors in Ukraine is 1.5-2 times higher than in other countries and the nurses visit are absent in Germany. The neonatal screening for genetic and metabolic diseases, updated in 2021 in Ukraine, corresponds to such screenings in other countries. Physical examination is performed in accordance with WHO standards in Ukraine, while in Poland and Germany the growth references are specially developed for the pediatric population. There was a difference in the age of hearing screening, examination of the hip joints, tactics for assessing vision by a pediatrician. The use of vitamin D, fluoride, iodine and vitamin K is recommended in Poland and Germany from the birth, while in Ukraine only vitamins are used.

Conclusions: It was found that the differences and similarities in preventive program in Ukraine, Poland and Germany. The results of this study may be useful for improving primary pediatric care.

KEY WORDS: preventive medicine, child, neonatal screening

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INTRODUCTION

Providing high-level medical care is a priority for the children's outpatient health care system. Well-child visits provide dynamic monitoring of the child's physical development, timely administration of necessary preventive vaccinations, doctor's consultation on breastfeeding and childcare [1,2]. Early screening of development and behavior children is necessary to identify development delays and to facilitate timely treatment. [3] Unfortunately, quite often at pediatric appointments doctors focuses on the treating diseases and does not pay attention to the prevention [4]. Therefore, preventive visits should be separated from the visits in which the doctor deals with developmental problems, treats acute or chronic diseases [5]. According to researchers, preventive pediatric care should be family-oriented and have community support [6]. Parents often search the information on child care, nutrition, etc. in the internet, but health professionals need to give parents an opportunity to discuss what they have found. [7] Regular routine visits to the pediatrician contribute to the early diagnostic of the pathological processes. The list of recommended screenings and the number of preventive visits to the doctor are determined

by each country in accordance with health guarantee and insurance programs. Comparative analysis of preventive screening programs will help to identify differences and similarities between programs in different countries. The results of this study may be useful for improving primary pediatric care.

THE AIM

The aim of this study was to compare and establish differences the recommendations for well-child visits and screenings till the age of 5 years in different countries.

MATERIALS AND METHODS

Governmental recommendations for pediatricians from Germany, Ukraine and Poland were used to compare the system of preventive care for healthy children. In Ukraine, a guideline (The Order №149)[8] for medical care for a healthy child under 3 years and guideline (The Order №434) [9] for a healthy child from 4 to 18 years have been developed for pediatricians and approved by The Ministry of Health of Ukraine. To evaluate the system of preventive

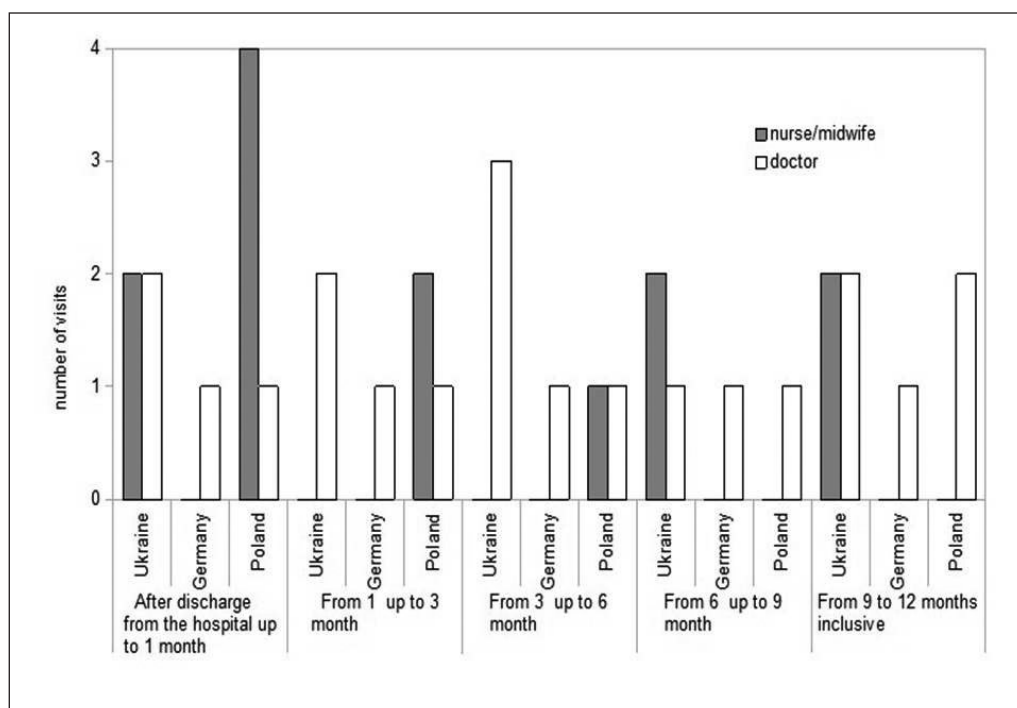


Fig. 1. Numbers of visits doctors and nurses to children during 1 year after the birth.

Table I. Recommendations for Screening in Ukraine, Poland, Germany

	Ukraine	Poland	Germany
Genetic and metabolic disorders	20 diseases [14]	23 diseases [15]	20 diseases [10]
Hearing screening	First 3 days: Transitory evoked otoacoustic emission. 3 month: automated auditory brainstem response [17]	First 3 days : Transitory evoked otoacoustic emission, automated auditory brainstem response [11]	First 3 days : Transitory evoked otoacoustic emission, automated auditory brainstem response [10]
Congenital heart defect	EchoCG is performed when signs of congenital heart disease are detected [8]	Pulse oximetry: SaO ₂ <96% - EchoCG [11]	Pulse oximetry screening (measurement at the foot), if incorrect –EchoCG [10]
Screening for hip joint dysplasia	Pediatrician checking the symptoms of Barlow, Ortolani. Orthopaedist and sonography at the 3 month [8]	Pediatrician checking the symptoms of Barlow, Ortolani, sonography at the 6th-9th week [11]	Pediatrician checking the symptoms of Barlow, Ortolani, sonography at the 4th–5th week [10]
Vision	Pediatrician checking the morphological deviations, fixation of gaze. If incorrect – ophthalmologist consultation, visual acuity test from 5 year [8,9]	Pediatrician checking the morphological deviations, fixation of gaze. Cover-test, Hirschberg -test visual acuity test from 5 year [11]	Pediatrician checking the morphological deviations, fixation of gaze. Bruckner test, visual acuity test from 3 year [10]
Iron deficiency	Complete blood count at 9 month and 5 years for all [8]	Complete blood count in children from risk group 6-9 weeks [11]	Complete blood count in children from risk group [10]

children examinations in Germany the book «Your child’s medical records (Kinderuntersuchungsheft)» was used [10]. The data on the preventive examinations of a child in Poland were taken from the child’s examination book «Książeczka zdrowia dziecka»[11]. At our study we evaluated such features of preventive program as the number

of visits to the doctor, the structure of the pediatrics’ visit, the responsibilities of the pediatrician, consultations with other specialists, laboratory tests and recommendations for supplements. Additionally, we used evidence-based recommendation according to the rating system [12,13] if such data were available.

RESULTS

The child care program includes visits by a doctor and a nurse or midwife. The number of visits for each country is presented in fig.1.

As shown in the figure, the total numbers of visits by doctors for 1 year of life in Ukraine is 13 visits, while in Poland – 6 visits, in Germany – 5 visits. At the same time, a nurse or midwife meets the child at home or in a clinic in Ukraine 6 times, in Poland 7 times, in Germany there are no scheduled visits to the nurse. After the 1-st year in Ukraine and Poland next visit is recommended after 6 month, then in all countries it is 1 times per year up to 5 years.

HISTORY

According to the recommendations for the visits during the first 2 weeks in all countries, the doctor should carefully collect the child's medical history, results of neonatal screening, pay special attention to the presence of hereditary and chronic diseases, allergies, immune system defects in the family. Subsequently, during each visit, the doctor collects information about breastfeeding and its difficulties, the child's sleep, defecation and urination and make examination of organs and systems. It is very important to evaluate immunization history in every visit.(grade C) [Katherine Turner]. In Ukraine, unlike Poland and Germany, vaccines against pneumococcal infection, rotavirus and meningococcus are not included in the mandatory vaccination schedule.

SCREENING

Screening recommendations at the different countries are outlined in table I.

From October 2021 in Ukraine, as well as in Germany and Poland, the screening of inborn errors of metabolism includes cystic fibrosis, hypothyroidism, congenital adrenogenital syndrome which are all performed with conventional methods (blood screening). There is also the screening for phenylketonuria, Maple Syrup Urine Disease, fatty acid oxidation disorders, medium-chain acyl-CoA dehydrogenase (MCAD) deficiency, long-chain 3-hydroxyacyl-CoA dehydrogenase (LCHAD) deficiency, very long-chain acyl-CoA dehydrogenase deficiency (VLCADD), carnitine inborn errors of metabolism, isovaleric academia, glutaric acidemia type 1, tyrosinemia type 1, which are performed with tandem mass spectrometry. There are recommendations to perform the screenings for severe combined immunodeficiency, sickle cell disease und 5q-associated Spinal muscular atrophy. [14-16,18].

COMMUNICATION

Effective communication between the doctor and the parents increases the parental adherence to medical care. It is important to assess the psycho-emotional situation in the family, symptoms of parental stress. The guideline

in Poland recommends to assess the signs of the postnatal depression. The Edinburgh Postnatal Depression Scale (EPDS) is the most common, but this questionnaire is not the only advertised. [19]. This evidence-based recommendation is the B Grade [12,13]. The psycho-emotional state of the mother and the support of the family significantly affect the duration of breastfeeding and health of the child. The significant effect of breastfeeding for more than 6 months on the relationship between mother and child has been proven [20]

NEUROMOTOR DEVELOPMENT AND PSYCHOSOCIAL ASSESSMENT

In all countries, the doctor evaluate neuro-motor development according to age. This assessment consists of such parameters as: coarse and fine motor skills, perception and cognition, social and emotional skills and regulation and stimulation. Reflexes from the neonatal period are also evaluated. It is important that in the manuals for doctors which were used for comparison, there are no scales or questionnaires to assess the psychosocial condition of the child. The American Academy of Pediatrics recommends screening for autism at 18-24 month (Grade C) [12,13]. It is no standardized tools, but M-CHAT questionnaire can be recommended for early screening of autism disorders. [21]

PHYSICAL EXAMINATION

At every visit doctor should perform a physical examination of the child. It is necessary to measure the height, weight, circumference of the head and chest and compare these results with the standards according to the age and sex of the child. In Ukraine all the measurements are compared with World Health Organization (WHO) percentiles and z-scores. The graphs of growth standards for Polish children are compared with the WHO only for children from 0 to 3 years. According to the results of the OLA study growth reference for children from 3 to 18 years have been significantly different from WHO recommendation [22]. The German book «Your child's medical records (Kinderuntersuchungsheft)» contains the information on growth reference that is recommended for children from 0 to 7 years. Percentile curves are based on the results of examination 17,147 boys and 17,275 girls aged 0-18. The survey of a large cohort of Polish and German children showed the differences between the recommended WHO and OLA study percentiles. [22]

LABORATORY INVESTIGATION

Screening for the iron-deficiency anemia (complete blood count) is recommended in Ukraine at the age of 9 months and in 5 years old for all children. In Poland and Germany it is recommended to perform the complete blood count with the purpose of early screening for iron-deficiency anemia in children from the risk groups, especially for premature children. Iron deficiency in infancy might lead

to the subsequent poor neurocognitive development; and there is a possibility that the prevention of neurodevelopmental consequences may require the screening and early treatment of multiple nutritional deficiencies, rather than iron deficiency only [23]. In Ukraine, for the children of 4 and 5 years old the tests for parasites, stool ova, urinalysis and blood glucose test are also recommended.

SUPPLEMENTS

Vitamin K is commonly recommended to be used after birth for the prevention of hemorrhagic disease of the newborn (HDN). In Ukraine it is a single dose (1.0 mg) of intramuscular vitamin K after birth. In Germany and Poland it is given oral three times: after birth, on the 4-6 days and 4-6 weeks at a dose of 2 mg. Vitamin K deficiency bleeding is the serious problem for newborn and young infants. It is necessary for parents to get prenatal education about vitamin K supplementation according to ESPGHAN recommendations [24].

Prevention of vitamin D deficiency and rickets is recommended in all countries. In Ukraine

it is recommended to start prophylactic dose of vitamin D for children under 3 years 1000 IU / day to be followed apply to all healthy children from the second months of life up to 3 years daily, except three months in summer [25]. In Germany and Poland the recommended vitamin D supplementation is at a dose of 400-500 MO per day for the first year of life and then just for risk groups [26].

In Ukraine fluoride supplementation is conducted depending on the child's dietary requirements and the fluoride level in the water, its intake with food (soy products, hypoallergenic foodstuffs, mineral water). Pediatric guidelines do not indicate the need to recommend fluoride supplements to children. But in Germany and Poland fluoroprophylaxis is recommended from neonatal period. Until regular exposure to fluoride in appropriate amounts is achieved (fluoride-enriched table salt and fluoridated toothpaste), the daily intake of a fluoride supplement is recommended for infants and children is recommended. [27] In addition, in Germany also prescribes iodine prophylaxis (iodine salt, mineral water).

DISCUSSION

The comparative study of the preventive programs in Ukraine, Poland and Germany show some differences and similarities. It is established and shown in Fig.1 that the number of visits to the doctor in Ukraine is more than in Poland and Germany, i.e. 13, 6 and 5, respectively. However, Poland demonstrates larger number of nursery/midwife visits up to the first 6 weeks of child life. It gives an undisputable advantages for families in controlling child care and breastfeeding. A frequent visits allow to establish trust relationship families to believe in care communications and further treatment with medical personnel (doctors, nursery). Decreased parental adherence to doctor visits is also seen as an increased risk of hospitalizations in young children [28].

According to the updated recommendations from 2021 in Ukraine, the list of diseases for neonatal screening is almost the same as in Germany and Poland, however, it is only available in large cities. It is very important to make screenings for severe combined immunodeficiency, sickle cell disease and 5q-associated Spinal muscular atrophy. The early treatment of SMA seems to be crucial for maximizing the therapeutic effects. Up to 30–60% (depending on the age of treatment initiation and the patient's baseline functional status) of children with SMA1, treated after the onset of disease symptoms, achieve the ability to sit by themselves without help [29]. So, the screening all the newborns for SMA is the best strategy for the successful treatment.

In the results of comparison of the methods of physical assessment of the child it was found that Germany and Poland conducted their own research to determine the growth references of child, while in Ukraine WHO recommendations are used. It is very important to assess the physical parameters in accordance with the country and ethnic characteristics.

The comparison of the pediatric visits (Table I) found that in Germany and Poland the pediatricians have more functionality. In addition to the physical examination of the child, auscultation of the heart and lungs and palpation, the doctor evaluates hearing and vision, sonography of the hip joints. The recommendations for visiting another specialist are provided only if the problems are identified. In Ukraine, the specialized examinations of vision, hearing and hip joints are conducted by ophthalmologist, otolaryngologist and orthopedist specialists. It is important that hearing screening in Poland and Germany is conducted in the first 3 days after the birth by two methods (Transitory evoked otoacoustic emission, automated auditory brainstem response), while in Ukraine only one method is used. Unfortunately, parents do not always pay attention to the results of neonatal screening and do not carry out the next examination at 3 months.

The examination of vision by pediatricians in Ukraine is limited to the external assessment of the eye, morphological deviations, fixation of gaze. German pediatricians are recommended to take the Brukner test, while pediatricians in Poland use Cover-test and Hirschberg test. The assessment of visual acuity is carried out from 3 to 5 years, which correspond to the international studies (Grade B)[12,13].

It is established that the analysis of sonography of the hip joints is performed at different ages in Poland, Germany and Ukraine, i.e. at 6-9 weeks, 4-5 weeks and 3 months, respectively (Table I). There is no international consensus in the world on the age at which ultrasound screening should be performed. This leads to the significant differences in screening programs across Europe, but it is recommended in the most countries to prevent the serious disability of the hip [30].

In Ukraine, there are no systematic studies to determine the level of vitamin D in the population. There are also no updated recommendations for the supplement of vitamin D. According to the European study, 400 IU daily

is a sufficient dose for infants and children 1 year of age to prevent the development of vitamin D deficiency. In Germany and Poland vitamin D supplementation is only recommended for older children having the risk factors and chronic diseases routine [26]. In Ukraine the doctors prescribe a test on 25(OH) to recommend an individual dose of treatment for D deficiency.

For the majority of European Countries, the EAPD recommends the appropriate use of fluoride toothpaste in conjunction with good oral hygiene. [27] In addition to oral fluoride supplements, it is also recommended to use fluoride gel during a visit to the doctor to protect teeth from caries (Grade B) [12,13]

CONCLUSIONS

The comparative analysis of the preventive screening programs of children in Ukraine, Poland and Germany, by involving the list of the proposed parameters, is carried out. As the results the proper differences and similarities were identified and analyzed.

There were found the differences in number of visits to children by the doctors and nurses, growth references, age of child for hearing screening and sonography of the hip joint, screening of iron deficiencies and supplements support. The similarity of approaches to neonatal screening, age assessment of visual acuity test, assessment of neuro-motor and psychosocial development is noted.

Thus, in order to improve the provision of medical care it is recommended to start the systematic study to determine the growth references of children in Ukraine. It is also necessary to provide more opportunities for pediatricians, at least in using new methods for vision assessment. The improved prevention with supplements (vitamin K, vitamin D, fluoride) in accordance with the international guidelines should be recommended for children. The results of this study may be useful for improving the primary pediatric care of children.

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The Authors declare no conflict of interest.

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