

CHILDREN EYE CARE IN GENERAL PRACTICE SETTINGS

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ABSTRACT

Background: There is no active strategy for childhood vision screening in Bulgaria. The only regular eye examination is made by general practitioners or pediatricians.

Method: Literature review.

Aims: Comparing the condition of childhood eye healthcare in general practice in our country with other countries and determining the disadvantages.

Results: The screening performed for childhood eye diseases in Bulgaria is insufficient compared to other countries.

Conclusion: It is necessary childhood eye examinations in general practice settings to be more often and precise or compulsory eye examinations by an ophthalmologist to be implemented.

Key words: *Vision screening, Childhood vision, General practice*

Background: There is no active national strategy for children eye screening in Bulgaria. The only compulsory examinations are made by general practitioners or pediatricians according to which professional the parents have chosen to take care of their child's health. These specialists are the ones to look for risk factors for eye diseases, to perform routine eye examinations and to send the children to an eye specialist on time whenever it is necessary. However, the question remains whether the examinations performed in general practice settings as well as the equipment are sufficient.

Methods: Review of the literature and the legal documents

Aims and tasks: Comparing children eye care performed in our country in general practice settings to the care performed in other countries. Acknowledging the disadvantages of the system in Bulgaria and creating prepositions for improvement.

Results:

There is a program made by the national health insurance fund in Bulgaria for children from the age of 0 to 18, called program of "Childhood Healthcare". This program is performed by a general practitioner or a pediatrician. It defines all the prophylactic activities (examinations, investigations, immunizations) which are compulsory during growth and development of the child from the age of 0 to 18. The physician chosen by the parent visits the child at home and performs the first examination of the child after being released from the hospital. The chosen physician is the one that the parents can look for when the child has a health problem and needs consultation, examination, hospital treatment, rehabilitation as well as prescribing medications. The parents can be consulted by this professional on every matter connected to the health of the child, who is the one to keep his medical record as well. The compulsory examinations of children eye health are performed at the age of 6 and 12 months, when a general eye examination is made and at the age between 7 and 18 when visual acuity and colour vision are tested every year. In the period between 1 and 7 years Bulgarian national program does not include a single examination of the child's vision. The main packet (2) of diagnostic and treatment activities included by the national health insurance fund considering eye health are the following – measuring visual acuity, without measuring the refraction, inspection of the eyelids, conjunctiva, sclera, iris, pupils, confrontation visual field test, general examination of eye movement and position, vision colour test and cleaning the eye. The compulsory equipment in general practice settings for eye examination is visual acuity chart and colour vision chart. According to ordinance No 36 from August 2010(5) for affirmation of "Ophthalmology standard" general practitioners can perform the following activities- measuring visual acuity, digital measuring of eye pressure, confrontation visual field test, examination of

pupillary reaction, looking for risk factors for eye diseases and hereditary eye diseases, referring to a specialist, recognizing emergencies and consulting them with a specialist.

Many eye diseases often met in childhood like congenital cataract, amblyopia and strabismus need to be found early and treated on time in order sufficient vision results to be achieved. Moreover, early detection of retinoblastoma and the immediate treatment is the only way the life of the child to be preserved. Congenital cataract is the leading cause of preventable blindness in childhood. The prevention includes immunization for rubella and screening by looking for red reflex. Screening is the best way to accomplish good vision results having in mind that the best time for operating congenital cataract is the age between 4 and 6 weeks. The British and American Pediatric Academy recommend the investigation of red reflex in newborn children, as well as on every following examination.(16) Red reflex needs to be examined in order to screen for retinoblastoma as well. It is a treatable condition when it is diagnosed on time and treated promptly. A multidisciplinary approach is needed in order to be detected early and treated properly. (18) The main symptom of this disease is white pupil- leucocoria. Other diseases like persistent hyperplastic primary vitreus, Coats disease, retinopathy of prematurity also can be presented with white pupil in which case children need to be send immediately to a specialist.(8) However, general practitioners in Bulgaria do not perform ophthalmoscopy, this activity is not included in their responsibilities or rights. Children are left without early screening for cataract and diseases of the posterior eye segment that need early detection in order good vision results to be achieved.

General practitioners should know as well what children are threatened by retinopathy of prematurity (1) in order to consult on time with a specialist. At a meeting in Varna, Bulgaria on 20-22 July 2009 the program for screening and treatment of children with retinopathy of prematurity is defined. (7) The following criteria were accepted in our country for children to be in risk of retinopathy of prematurity- gestational age under 32 weeks and weight under 2000 g., artificial ventilation, intracranial hemorrhage, blood transfusion, intrapartum asphyxia, sepsis. The first examination must be performed when the child is four weeks of age, the following examination must be performed after two weeks. According to a British investigation on children, threatened to develop retinopathy of prematurity, eye examinations must be focused on infants weighing less than 1251 g and gestational age under 30 weeks because severe retinopathy develops only in this cases. According to this investigation the gestational age and birth weight are the only risk factors. The period when the developing retinopathy was found during this investigation was at the average age of 5, 5 weeks+/- 2 weeks. (17) The same results were published in 2005 in JAAPOS. (13)

Strabismus is characterized by a manifest deviation of the visual axes and secondary sensory deteriorations.(3) Strabismus is a frequent affection which primarily involves the child, during early life. It is a frequent and severe disease (3 to 4% of the French population), if it is left untreated the prognosis is severe with the functional loss of the deviated eye. The clinical picture, and the prognosis depend considerably on the age of onset. Strabismus is always linked to amblyopia, explaining the need for a rigorous examination and adapted treatment the earliest possible: a collaboration between pediatrician, general practitioner, ophthalmologist and orthoptist is essential. (11) According to an investigation performed in Singapore the examination of children's visual acuity in order to prevent amblyopia must be performed at the age of 3-4 years because amblyopia is most easily treated at this age.(15) No visual acuity test is performed between the age 1 to 7 years in Bulgaria. That's the reason why amblyopia is often found at school age, when treatment is too late, and children are burdened with great responsibilities at school, which leads to their falling behind.

In other counties the situation is quite different. The American Ophthalmology Academy recommends vision screening to be performed after birth, and afterwards at the age of 3 months, 6 months, one year, three and five years. Children with high risk- prematurely born and with positive family history must be examined by a specialist. Children must be examined for red reflex, pupillary reactions and eye movement before the age of three years and after the age of three their

visual acuity must be tested as well. Photo-screening and handheld refractometers are other devices that help the screening of children in the USA as well because they can easily be performed by a non-specialist. (19)

The performance characteristics of the screening programs used in Sweden were evaluated and found to be very favourable. Based on the analysis and the evaluation, recommendations are made on programs for vision screening in children that could be applied more widely. The program could involve all or parts of the following: 1) A careful inspection of the eyes in the neonatal period and preferably also examination of the red reflex with an ophthalmoscope. 2) Children at high risk for ocular and visual disorders, i.e. those born prematurely before 32 weeks of age, or with genetic disease, hearing deficit and/or neurological and mental disorder, should be examined at the proper age by an ophthalmologist. 3) All staff at pediatric departments and child health care centers should be familiar with the visual development of the normal baby and should be alerted to the various symptoms and signs which first warn parents that there may be a visual defect. An inspection of the eyes to detect squint should be part of all pediatric examinations. 4) A screening test of monocular visual acuity in 4 year-old children can be reliably performed by non-ophthalmic personnel after proper training. The screening test should be repeated by school nurses during the first grade of school, and at regular intervals during the school years. 5) The children that screen positively should be seen by ophthalmologists, and in some cases by orthoptists, without undue delay for diagnosis and treatment.(14)

Early examinations of children in France are performed after birth, at the age of 2, 4, 9 and 24 months. (9) Early examinations of children in the Czech Republic are performed after birth, at the age of 5, 8 and 12 months. (12)

In New Zealand the examination of newborn children also includes ophthalmoscopy for examining the red reflex after birth and at the age of 6 months. Other examinations are performed afterwards at the age of 3, 5, 8-10, 15, 21-24 month and 4 years. These examinations include the questionnaire "Can your child see?" At the age of 6 and 15 months examining eye movement and cover test are included, as well as examining the symmetric reflection of the light from the ophthalmoscope by the cornea. Visual acuity is measured at the age of 4 and 5 years and after that at the age of 11 visual acuity and colour vision are tested. (21)

In a Canadian literature review the childhood vision screening is investigated. Primary care physicians should screen all low-risk children. High-risk children (low birth weight, family history of strabismus, congenital ocular abnormality, or systemic conditions with vision-threatening ocular manifestations) should be referred to an ophthalmologist for screening. Screening should be performed in the neonatal period at 6 months, and 3 years (Grade A recommendation), as well as at 5 to 6 years (Grade B recommendation). Screening examination includes inspection, examining visual acuity, determining pupillary reactions, checking ocular alignment, testing eye movements, and ophthalmoscopy. (20) The recommendations of the Canadian pediatric association are the following: newborn children must be examined for red reflex in order to screen for cataract and posterior eye segment abnormalities, anterior eye segment must be examined as well. High-risk children for retinopathy of prematurity as well as hereditary diseases must be referred to a specialist. At the age of six and twelve months must be checked if the child follows a finger, and to be examined for strabismus by checking the reflection of the ophthalmoscope on the cornea. In the period between 3 and 5 years must be measured visual acuity as well. At the age of 6-8 years another routine check must be done. According to the investigations screening of visual acuity before the age of 3 is connected to lowering amblyopia to 70 percent. (10)

As a whole, screening of childhood vision, performed in Bulgaria is not so well emphasized compared to those performed in developed countries.

Conclusion:

Childhood vision screening is insufficient and additional examinations should be added to general practice. Missing the examination of visual acuity in the period between the age of 1 and 6

is unacceptable. It is necessary at least an examination of visual acuity at the age of 3-4 years to be included.

The lack of ophthalmoscope and the fact that general practitioners are not obligated to examine the red reflex leaves without screening some very serious eye diseases. It is necessary additional equipment to be included as well as increasing the qualification of the general practitioners.

Otherwise, it is necessary compulsory examinations by a specialist to be included in the national program. In an article of V. Marinov, T. Boeva and N. Sivkova is discussed the matter of general practice children eye care and when examination by an ophthalmologist is needed. According to this article it would be convenient children to be examined by a specialist at the age of 1, 2, 3 months, and 1 and 3 years afterwards, as well as at pre-school and school age once or twice a year.(4)

Finally, this review will be used as a base for following investigations and suggestions on screening of children vision in Bulgaria. In order to improve the results of the performed prophylaxis, parents as well as general practitioners could be provided with brochures and other materials including information for vision screening in childhood.

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