

EYE DEVELOPMENT SCREENING THE THE GENERAL PRACTICE SETTING

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Introduction: General practitioners play a central role in monitoring the development of children. The evaluation of the visual analyzer is part of this activity. It's injuries are not limited to reduced vision, but can also become severe cosmetic and psychological problems and limit the opportunities for further professional development. The vast majority of eye diseases are hereditary or are manifested during the first years of life. When caught early enough and timely referred to an ophthalmologist for treatment, lasting damage can be prevented and they can be controlled or cured.

Aims and tasks: To analyze the role of general practitioners in child eye care

Methods and material: Literature review

Results and discussion:

Conclusion: Unlike Bulgaria, in most developed countries the primary care physician examine red reflex and visual acuity is examined between 3-5 years of age. General practitioners have a role in discovering hereditary cataract, amblyopia, retinoblastoma and retinopathy of prematurity.

Keywords: *eye care, children, general practitioner*

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Aims and tasks: To analyze the role of general practitioners in child eye care

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Results and discussion: General practitioners could have a major role in early detection of diseases such as congenital cataracts, amblyopia, strabismus, retinoblastoma, whose early detection is the only guarantee for the best visual outcome (20).

The National Health Insurance Fund in Bulgaria has developed a program "Children's health" for children between 0-18 years. This program is executed by the general practitioner of the child or by a pediatrician. It defines all preventive activities (examinations, immunizations) that are required in monitoring the growth and development of children - from birth to 18-year age (6). A Physician chosen by the parents visits the child at home. He conducts a full examination of the newborn within 24 hours after its discharge. The first visual assessment takes place after birth, then at 6 and 12 months. Between 7 to 18 years children are tested for visual acuity and color vision once a year. Between 2 and 7 years there is only one examination for visual acuity

At present in Bulgaria there is no actively operating and accepted national strategy for the prophylaxis of children's vision, despite the alarming publications on the subject (3). This fact increases the burden on primary care physicians. According to the conducted screening study of 171 children in kindergarten, "Osmi Mart" in Plovdiv in 2010, conducted by V. Marinov abnormal ocular status occurred in 46 (26.9%) of the children, while only 10 of them were examined by ophthalmologists to date (4). Another similar study conducted among preschool children in the city of Sofia, showed a very small number of children examined by an ophthalmologist (7). Examinations that are included in the "Children's health" are insufficient for adequate control. A research by V. Marinov, T. Boeva and N. Sivkova deals with the care for eyesight of children by GPs, which items they should pay attention to during examination and when a referral to an ophthalmologist is needed. According to their paper children should be consulted by an ophthalmologist at 1, 2, 3 months, first and third year, as well as 1-2 times a year in school and preschool age (4).

Unlike Bulgaria, where mandatory vision examinations are carried out by GPs who examine only color vision and visual acuity, other countries introduced the study of the red reflex, and required examinations by an ophthalmologist in high-risk groups of children (premature, hereditary, etc.) - for example in Canada. There is also an additional examination of visual acuity between 3 to 5 years, whereas there is only one examination in Bulgaria between 2 and 7 years of age (23). The American Academy of Ophthalmology recommendations are similar. The introduction of new techniques as photoscreening and handheld autorefractometer, significantly facilitate the screening performed by non-ophthalmologist physicians (22). American Academy of Pediatrics and Pediatric Ophthalmology, the American Academy of Ophthalmology and General Medicine recommends the first eye examination of newborns to be done after birth by a GPs and then again at each checkup (18). Screening program for visual disorders in Sweden also includes the possible examination of the red reflex and referral to an ophthalmologist for high risk children. When the child is 4 year-old GPs should explore monocular visual acuity (15). The same applies to New Zealand, where they also include a questionnaire "Can your child see?" for the parents (24).

The proper study of visual acuity of children 3-5 years of age is extremely important for preventing complications of strabismus and amblyopia. An article by prof. Aleksieva and assoc. prof. Chernodrinska in 2005, published in GP News, describes the capabilities of GPs in terms of strabismus diagnosis (1). The earlier the disease is treated the better the visual outcome. If treatment is delayed the prognosis becomes severe and can lead to permanent loss of function of the affected eye. For best results improved interaction between paediatricians, GPs, ophthalmologists and orthoptists is required. A study on vision screening in children, held in Singapore, examines the criteria for ophthalmologist referral. Prevention of amblyopia and strabismus requires examination of visual acuity between 4-4,5 years, with referral to a specialist of children with visual acuity below 0.5, and those who cannot be tested (16). In general, all evidence suggests that the study of visual acuity of preschool children can identify vision problems at a critical period of development of the visual system and lead to treatments which improves visual outcomes. In a literature review of the period 1950-2009, it was concluded that direct data for improved visual outcomes as a result of pre-school screening are limited. More research is needed to compare the results from the lack of screening with

those in the presence of the case (12).

Study on 150 children with strabismus from orthoptics clinic in Newcastle showed that the majority of these vision problems were seen first by their parents and relatives. In many of these children referral to a specialist was delayed more than six months (2, 14). The results are shown in Table 5 and 6.

Table. 5 First noted strabismus symptoms

| First noted the problem | Number of children |
|--------------------------------|---------------------------|
| Parents | 90 |
| Parents, friends, teachers | 24 |
| Visiting physician | 5 |
| Public health service | 29 |
| GP | 6 |

Table. 6 Referral to a ophthalmologist

| Referral delay (in months) | Number of children |
|-----------------------------------|---------------------------|
| 0-5 | 70 (47%) |
| 6-11 | 32 (22%) |
| 12-23 | 28 (19%) |
| 24-47 | 11 (7%) |
| Over 48 | 7 (5%) |
| Total: | 148 (100%) |

Unfortunately, cases of amblyopia are often not diagnosed until it's too late. A review of the files of children from children's ophthalmology department (USA) shows that amblyopia often occurs in children who have access to health care. Children diagnosed in time - before the age of five, were compared with those diagnosed later. Children who were diagnosed on time more often had the following characteristics - a positive family history, a higher degree of strabismus, high level of education of the mother, greater distrust of the parents that the child has vision problems (11).

Red reflex examination, which in Bulgaria is not carried out in general practice could be used as an early screening of many diseases encountered in childhood. Such a disease is retinoblastoma. It is curable when diagnosed in time and treated properly (21). Leukocoria in children is often a manifestation of retinoblastoma. Usually, family members notice the first symptoms and consult with either a GP or a pediatrician (9). According to a survey in Belgium, conducted on children with retinoblastoma, the time between the first appearance of

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clinical symptoms and diagnosis of retinoblastoma was on average 3.2 months. Most children with retinoblastoma were found in advanced disease (25). In New York in 2002 a research was conducted on children with retinoblastoma in ocular oncology centers. In 75% of children parents are the first to notice symptoms. Of these, 77% were late in seeking treatment and primary care physicians delayed the referral to a specialist in 30% (10). According to a study from 2003 conducted in New York, 80% of patients with retinoblastoma were originally discovered by family and friends, despite routine examinations for red reflex (8).

General practitioners also play a role in visual hygiene. With the influx and wide spread of computer technologies children have a wide variety of visual display in the form of smart phones, tablets, laptops and personal computers. GPs should give instructions to the parents and rules for their usage such as distance, sitting position and rest (4).

Children are a priority of the global initiative "Vision 2020" of the WHO for prevention of avoidable blindness. Congenital cataract is the leading cause of preventable blindness in children, both through primary prevention such as immunization for rubella and through secondary prevention through early screening with red reflex examination. Considering that the best time to remove congenital cataracts, to get the maximum effect of treatment is 4-6 weeks of age, screening is an essential element for achieving good results. American and British Academy of Pediatrics recommend examination of the red reflex in infants, as well as in any subsequent checkups of the children (142). A survey conducted in Ireland, consider when and how to diagnose cataracts. Of the cases examined, 63 percent were discovered by parents or people who care for children. Only two of the 17 cases, however, have been found before 3 months of age, with 24% of cases discovered by GPs. No case of cataract was found at newborn screening (208). All children with congenital cataracts, diagnosed in Britain in the period from October 1995 to September 1996 were studied. Of these, 35% were discovered during routine examination of newborns and 12% in the period 6-8 weeks, 57% were examined by an ophthalmologist before 3 months of age, and 33% only after the first year (181). In Israel, following the introductions for red reflex examination of newborns in health centers five cases of congenital cataracts were discovered 2-6 days after birth in 2007-2008. Authors recommend routine examinations for red reflex (17).

General practitioners should be aware which children are at risk of retinopathy of prematurity so they can seek timely consultation with a specialist. In Bulgaria on 20-22.07.2009, at a meeting in Varna a program was defined for screening and treatment of retinopathy of prematurity. In our country the criteria adopted for screening for retinopathy of prematurity are age - before 32 weeks and weight under 1500 g., and children weighing less than 2000 grams. who are on mechanical ventilation with intracranial hemorrhage, transfusion, severe asphyxia and sepsis. First examination is set four weeks after birth, control examinations should be held every two weeks. According to a study conducted in the UK, eye examinations should focus primarily on children weighing less than 1251 g. and gestational age below 30 weeks. According to the American Academy of Pediatrics children weighing under 1500 g and less than 28 weeks., which reduces the number of screened children compared to the older recommendations that include children under 34 weeks under 1800 grams.

Conclusion: Unlike Bulgaria, in most developed countries the primary care physician examine red reflex, visual acuity is examined between 3-5 years of age and high risk children

are referred to an ophthalmologist. General practitioners are part of the multidisciplinary team that discovers and treats hereditary cataract, amblyopia, retinoblastoma and retinopathy of prematurity.

There is still no distinctive line between the obligations of an ophthalmologist and general practitioner, not only in Bulgaria, but also worldwide. Improved communication and collaboration between them is a major factor for adequate eye care services in children.

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