Acıbadem Univ. Sağlık Bilim. Derg. 2023; 14 (3): 360-365
https://doi.org/10.31067/acusaglik.1218839

Pediatricians' Approach to Eye Diseases in Balıkesir province,Turkey

Hümeyra Yıldırım Can[1], **Selçuk Yazıcı**[2]

[1]Balıkesir University, Faculty of Medicine, Department of Ophthalmology, Balıkesir, Turkey

[2]Balıkesir University, Faculty of Medicine, Department of Pediatric Health and Diseases, Balıkesir, Turkey

Hümeyra YILDIRIM CAN

Selçuk YAZICI

Correspondence: Hümeyra Yıldırım Can
Balıkesir University, Faculty of Medicine, Department of Ophthalmology, Balıkesir, Turkey
Phone: +905305244841
E-mail: balikesirhumeyra@gmail.com

Received: 14 December 2022
Accepted: 26 April 2023

ABSTRACT

Objectives: Evaluate the approaches of pediatricians and their assistants who work in Balikesir province,Turkey to eye diseases and their applications in this field.

Materials and Methods: 39 pediatricians and 9 specialty students were working in Balikesir, and its districts were reached. The data were collected using a 21-question questionnaire. SPSS 21.0 program was used to evaluate the data.

Results: 39 specialists and 9 physician assistants completed the questionnaires and participated in our study. 68.8% of respondents know the Brückner test. 33.3% apply the Brückner test, 45.8% no, 4.2% frequently, and 16.7% rarely. Direct ophthalmoscope examination on pediatric patients was not performed by 62.5% and when needed in 33.3%. 16.7% of doctors considered that the internship training on eye diseases received at the Faculty of Medicine was sufficient, no 37.5%, and 45.8% partially. When the physicians who answered no or partially were asked about the reason for this, the most common reason was that they had less opportunity to practice during the internship (87.5%).

Conclusions: Evaluating eye health is part of routine health checks in newborns and childhood shared by pediatricians. Therefore, it is necessary to ensure that pediatricians have sufficient equipment and knowledge about the basic screening tests.

Keywords: Pediatricians, survey, eye diseases

Balıkesir İlindeki Çocuk Hekimlerinin Göz Hastalıklarına Yaklaşımı

ÖZET

Amaç: Balıkesir ilinde çalışan çocuk hekimi ve asistanlarının göz hastalıklarına yaklaşımlarını ve bu alandaki uygulamalarını değerlendirmek amaçlanmıştır.

Gereç ve Yöntem: Balıkesir ili ve ilçelerinde çalışan 39 çocuk hastalıkları uzmanı ve 9 uzmanlık öğrencisine ulaşıldı. Veriler hekimlerin kendilerinin doldurduğu 21 soruluk anket formu ile toplandı. Verilerin değerlendirilmesinde SPSS 21.0 programı kullanıldı.

Bulgular: Çalışmamıza 39 uzman ve 9 asistan hekim anketleri doldurarak katıldı. Brückner testini biliyor musunuz sorusuna 33 hekim evet (%68,8) 15'i hayır (%31,2) yanıtını vermiştir. Brückner testi uyguluyor musunuz sorusuna ise, 16 hekim evet (%33,3), 22'si hayır (%45,8), 2'si sıklıkla (%4,2), 8'i nadir (%16,7) olarak uyguladığını belirtti. Çocuk hastalara direk oftalmoskop muayenesi yapıyor musunuz sorusuna hekimlerin 30'u hayır (%62,5), 16'sı (%33,3) ise ihtiyaç halinde uyguladığı yanıtını vermiştir.. Tıp Fakültesinde aldığınız göz hastalıkları staj eğitiminin yeterli olduğunu düşünüyor musunuz? sorusuna 8 hekim (%16,7) evet, 18'i hayır yanıtını verirken 22'si kısmen yanıtını vermiştir. Tıp Fakültesindeki göz hastalıkları staj eğitimi yeterli mi sorusuna sadece 8 hekim (%16,7) evet yanıtını vermiş, hayır ya da kısmen diye cevaplayan hekimlere bunun nedeni sorulduğunda ise en sık neden olarak staj süresince pratik yapma imkanının az olması (%87,5) gösterilmiştir.

Sonuç: Yeni doğan ve çocukluk döneminde rutin sağlık kontrollerinin bir parçası olan göz sağlığını değerlendirmek çocuk hekimlerinin de sorumluluğundadır. Bu nedenle çocuk hekimlerinin göz sağlığını değerlendirmede kullanılan temel tarama testleri hakkında yeterli donanım ve bilgiye sahip olmalarını sağlamak gerekir.

Anahtar Kelimeler: Pediatrist, anket, göz hastalıkları

Early detection and treatment of ocular diseases in childhood are important to prevent lifelong visual problems. Examination of the visual system begins in the newborn period, and all routine checks of the infant also include an assessment of eye health (1). Pediatricians are the first doctors to perform a newborn examination after childbirth, and it is critically important for the health of the newborn that they notice and direct the eye pathologies during this period. To have a healthy visual system, a visual stimulus is needed beginning from birth. Receiving sufficient visual stimuli in the first years of life is necessary for the maturation of the visual system and healthy vision. The sense of sight is of critical importance in the development of the child (2). A healthy sense of vision enables the child to relate to the social environment, and notice and evaluate the education and training opportunities around him/her.

The American Academy of Pediatrics recommends external inspection of the eyes and adnexa, vision examination, the red reflex test, pupil examination, and evaluation of eye movements for the eye health of infants according to the developmental stage from birth in the routine examinations of pediatricians. In this way, it may be possible to detect and treat diseases that may cause serious vision loss such as congenital cataracts, congenital glaucoma, retinoblastoma, and strabismus that may be encountered in early childhood at an early stage (3,4).

The red reflex test is a basic eye screening test that can also be applied by pediatricians and family doctors and is accepted by the American Academy of Pediatrics as part of the newborn, infancy, and childhood physical examination. The red reflex test is vital for the early detection of some diseases that may be vision- and life-threatening such as cataracts, glaucoma, retinoblastoma, retinal problems, eye signs of systemic diseases, and high refractive defects (1). It is applied by evaluating the light reflected from the ocular media at a certain distance with the help of a direct ophthalmoscope.

The study aims to evaluate the approaches of pediatricians who follow up on infant and child patients from the newborn period to children's eye health using a questionnaire.

Materials and Methods

The study was conducted in Balıkesir as a cross-sectional survey between October - November 2020. It was aimed to reach 62 pediatricians who are actively working in Balıkesir province and districts. However, 14 physicians could not be reached and 39 specialist pediatricians and 9 research assistants (specialist students) from the Department of Pediatrics at Balıkesir University's Faculty of Medicine participated in the study. Participation in the study was based entirely on volunteerism. During the data collection period, after the participants read the voluntary participation form and agreed to participate in the study, the questionnaires were applied by face-to-face interview. In addition, questionnaires were sent to 2 physicians via e-mail.

The completed questionnaires were evaluated for the study. Approval was received from the Balıkesir University Faculty of Medicine Clinical Research Ethics Committee (dated 19.08.2020 and numbered 2020/117) for the questionnaire study. In the creation of the questions in the questionnaire form, recommendations of The American Academy of Pediatrics for pediatricians and family physicians were used as a base, and some examples of questions from the study conducted by Can and Erbaydar in 2009 were also used (1,5). Since the majority of the physicians participating in our questionnaire were working at the 2nd level and as self-employed, no questions about retinopathy of prematurity were added to the questions in the questionnaire.

The data were analyzed using the IBM SPSS statistical program (Version 25). Descriptive (numerical) data were expressed as Mean+-Standard Deviation (Mean+-SD). Categorical data were expressed as frequency and percentage (%).

Findings

39 specialists (81.3%) and 9 research assistants (specialty students) (18.8%) participated in our study by filling out the questionnaires. The physicians' working time as pediatricians ranged from 0.3 years to 41. 24 physicians were working at the 2nd level (50%), 13 physicians were working in the private sector (27.1%) and 11 physicians were working at the 3rd level (22.9%). Some examples of questionnaire questions are given in Table 1. When asked about the number of pediatric patients presenting with eye complaints in a month, it was seen that there were 32 physicians (66.7%) with 10 or fewer patients, 7 physicians (14.6%) with 11-20 patients, 6 physicians (12.5%) with 21-30 patients, 1 physician (21.1%) with 31-40 patients, 2 physicians (4.2%) with 41 and above patients per physician. 68.8% knew the Brückner test. But 45.8% do not apply the Brückner test, 33.3% apply it, only 4.2% frequently, and 16.7% rarely. Direct ophthalmoscope examination on

pediatric patients was not performed by 62.5% and when needed in 33.3%. Data on the approach to eye scanning test are given in Table 2. 37.5% knew how to apply the Hirshberg test, but only 2.1% applied the Hirshberg test. The age periods doctors recommended an ophthalmologist examination for children were 75% for 0-3 months, 16.7% for 1-year-old, 12.5% for 3-year-old, and 10.4% for 6-year-old (more than one choice was possible). The child's vision was examined by 31.3%, rarely 37.5% and not by 29.2%. Strabismus examination was performed by 37.5% of doctors, only when needed in 35.4% and not in 27.1%. Data on the approach to children presenting with eye complaints are given in Table 3. 19 physicians (39.6%) stated that they gave massage + antibiotic drops to patients with lacrimation complaints, and 3 physicians (6.3%) did not answer this question.

Table 1. Examples from questionnaire questions

How many years have you been working as a pediatrician?
How many children are admitted to the health institution where you work due to eye complaints in a month?
Do you know how to apply the red reflex test (Brückner) to pediatric patients (0-2 years old)?
Do you apply a red reflex test to children 0-2 years old?
Do you know how to apply the Hirshberg test (lantern) to pediatric patients?
Do you conduct fundus examination with an ophthalmoscope directly on pediatric patients?
Do you apply the Hirshberg test (lantern test) to pediatric patients?
Do you examine pediatric patients for strabismus?
Do you have a patient under the age of one, who has been complaining of lacrimation since birth?
If yes, what is your approach?
How do you evaluate vision problems in children with whom you have detected developmental retardation?
In which period do you recommend an ophthalmologist examination for children who have no/unreported eye complaints?
If there are no complaints, do you examine the child's vision problems?
How often do you need to consult an ophthalmologist for pediatric patients?
What are the situations when you feel the need to consult an ophthalmologist?

Table 2. Approach to eye scanning tests

Do you know the Brückner test?	n	%
Yes	33	68.8
No	15	31.3
Total	48	100
Do you apply the Brückner test?	n	%
Yes	16	33.3
No	22	45.8
Frequently	2	4.2
Rarely	8	16.7
Total	48	100
Do you perform direct ophthalmoscope examination?	n	%
Yes	2	4.2
No	30	62.5
When needed	16	33.3
Total	48	100
Do you know the Hirsberg test?	n	%
Yes	18	37.5
No	30	62.5
Total	48	100

Table 3. Approach to children with eye problems

Do you examine pediatric patients for strabismus?	n	%
Yes	18	37.5
No	13	27.1
I apply when needed	17	35.4
Total	48	100
Do you have a patient under the age of one, who has been complaining of lacrimation since birth?	n	%
Yes	43	89.6
No	5	10.1
If yes, what is your approach?	n	%
Referring	4	8.3
Massage	22	45.8
Massage+Antibiotics	19	39.6
How do you assess the problem of vision in children with developmental disabilities?	n	%
I treat them myself	3	6.3
Referral to the ophthalmologist	42	87.4
Massage+Antibiotics	3	6.3
*What are the conditions that you refer to the ophthalmologist?	n	%
Vision problems	42	87.5
Strabismus	29	60.4
Infantilism	29	60.4
Headache	15	31.3
Other	11	22.9
(more than 1 option is selected)		

Ophthalmologists are consulted most often due to vision problems (87.5%). The evaluations of the physicians about the ophthalmology internship training received at the Faculty of Medicine and the approaches to eye diseases are given in Table 4. 16.7% considered that the internship training in ophthalmology at the Faculty of Medicine was sufficient, and when the physicians who answered no or partially were asked about the reason for this, the most common reason was the low opportunity to practice during the internship (87.5%). The most common recommendation to overcome the lack of training in eye examination of pediatric patients is practical training, with a rate of 56%. Only 6 physicians (12.5%) were trained for pediatric eye diseases as assistants.

Table 4. Training and Approach to Eye Diseases

Is the eye internship in medical training sufficient?	n	%
Yes	8	16.7
No	18	37.5
Partially	22	45.8
Total	48	100
*If your answer is no, what are the reasons?	n	%
The short duration of the internship	13	32.5
Insufficient theoretical training	2	5
Limited opportunity to practice in the internship	35	87.5
Total	48	100
Have you received any training for children's eye diseases as an assistant?	n	%
Yes	6	12.5
No	42	87.5
Total	48	100
*What kind of approach is appropriate for the lack of an eye examination in children?	n	%
Theoretical training	14	29.2
Practical training	27	56.5
Distance training	6	12.5
Congresses	8	16.7
Other	6	12.5
Total	48	100
*(more than 1 option is selected)		

Discussion

The red reflex test is an eye screening test used in infancy and early childhood and is an obligatory part of the newborn examination and is used to detect many pathologies, including cataract, corneal opacity, retinoblastoma, and retinal detachment that may be involved in the visual axis (1). The American Academy of Pediatrics recommends the red reflex test in the examination of children aged 0-6 months, 1 year, 3 years, and 6 years. The test is performed with the help of an ophthalmoscope in a dim environment. The ophthalmoscope focuses on the child's pupil at about 45-90 cm. The color, intensity, and transparency of the light reflected from both eyes are evaluated (1).

The American Academy of Pediatrics recommends that all newborns undergo a red reflex test by pediatricians or other primary-level physicians. For the reflectance received from both eyes to be considered normal, it must be bright, symmetrical, of equal density, and should contain no spots and opacity. In case abnormal red reflex detection, it recommends that the baby be directed to a pediatric ophthalmologist (1-4).

Regardless of the the red reflex test result, if the baby or child has a positive family history of retinoblastoma, strabismus, congenital cataract, or congenital glaucoma, they should be directed to an ophthalmologist for a detailed eye examination.

To reduce or prevent permanent vision loss caused by congenital cataracts, it is important to detect it as early as possible and operate within the first 6 weeks (6). In this way, irreversible amblyopia associated with congenital cataracts can be prevented with timely diagnosis and appropriate closure treatment after surgery. In the study of Yazgan et al., a double-sided congenital cataract was detected in 2 infants and retinoblastoma in one infant during the examination of 2718 newborns with a red reflex test by pediatricians (7).

Eye scanning with a red reflex is performed by more than 90% in maternity and pediatric clinics in Sweden, and a significant increase in the early detection of congenital cataracts by 50% versus 64% was found compared to the period when it was not performed. Again, in a study in which two Northern European countries are compared, the detection rate of congenital cataracts at an early stage in Sweden, where the red reflex test is routinely performed, was found to be higher than in Denmark, where the test was not performed (8,9).

In a study conducted by Özkurt et al. on eye screening tests for family doctors in and around Diyarbakır, 52% of the participants stated that they performed the red reflex

test, 36% knew about the test but had not performed it, and 12% never heard of the red reflex test. In our study, 31.3% of pediatricians stated that they did not know about the red reflex test, while 68.8% said that they did. The rate of physicians who routinely perform the red reflex test is 33.3% (10).

As part of the National Vision Program launched by the Ministry of Health in 2015, eye screening is performed by family doctors from 0-3 months. Thanks to this program, it is aimed to discover the diseases that will cause vision loss in early childhood early and prevent vision loss (11).

In the eye scan conducted by Toygar et al. on 3568 6-14-year-old primary school students in Istanbul, it was found that 41.2% of cases developing amblyopia were detected during the scan (12).

The Hirshberg test (light reflection test from the cornea) is used to assess the parallelism of the eyes. A light source is held at 50 cm from the child so that the light is in the center of both eyes. It can be used for screening purposes in strabismus examination (13). 37% of the physicians participating in our study stated that they knew about the Hirshberg test, but one of them stated that s/he applied it routinely, while 13 physicians (27.1) stated that they applied it when needed.

Although the eye examination is part of the general health examination, the rate of physicians who routinely examine vision problems is 31.3%.

In the study in which Regassa et al. evaluated the knowledge and approaches of pediatricians to children's eye diseases, 86.1% of the participants performed an eye examination, while the rate of its application at each visit was 36.7% (14).

In the questionnaire study conducted by Biten et al. on family physician assistants in Ankara, only 12.8% of the participants think that the eye diseases training given in the medical faculty is sufficient. In comparision, 54.1% do not find it sufficient. 75.4% of those who think that the eye diseases internship given in the medical faculty is not sufficient to think that the most common reason for this is the lack of practice opportunities (15). Similarly, in our study, 37.5% of the physicians think that the internship training in eye diseases is insufficient, 45.8% think that it is partially sufficient, and the most important reason for this is the lack of practice opportunities (87.5%). In the studies of Can and Erbaydar for family physicians in Van, it was observed that physicians mostly referred to general medicine books (83.3%) and specialist physician friends (37.9%) as the information source about eye diseases (5).

Pediatricians having sufficient knowledge and skills about the application of basic screening tests will also increase the applicability of the tests (14). During the internship period of the faculty of medicine and then during the specialty training, it is necessary to organize training that is predominantly about practical applications. As part of the National Vision Program, carrying out practices such as training provided to family doctors abroad on eye screening tests for pediatricians will increase awareness about this issue. Due to the simple and easy applicability of the red reflex test, and its high sensitivity, it should be part of the newborn examination and included in the pediatric specialty training (16,17).

Since pediatricians are the first physicians to encounter newborns, our study aimed to identify the missing approaches and provide recommendations on this issue.

Limitations of the Study

Although questionnaire questions about follow-ups for Premature retinopathy of vision (ROP) were not included because it also includes self-employed physicians, ROP follow-up is also within the responsibility of pediatricians, and the lack of questions about it is one of the missing aspects of the study. Other limited aspects of our study are that since it only covers the province of Balıkesir, it does not reflect all the pediatricians in our country and their evaluations. Since it is a questionnaire study, it only covers the opinions and statements of the participants.

Conclusion

The ability of pediatricians to perform screening tests for the eye health of infants during the newborn period is significant for the early detection of eye pathologies that may affect the child's entire life. Therefore, pediatricians should be adequately equipped with screening tests critical for evaluating newborn eye health. It is important to include the regulations for providing the necessary knowledge and skills to physicians for these basic screening tests in the training program, both in the eye health internship training program at the faculty of medicine and in the child health specialty training.

Declarations

Ethical Approval

This study was conducted in accordance with the principles of the Declaration of Helsinki and was approved by the Balikesir Faculty of Medicine Ethics. (date: august 19, 2020; no:2020/117)

Author Contribution

Hümeyra Yıldırım: Conceptualization, data curation, project administration, formal analysis, writing – original draft, writing – review and editing.

Selçuk Yazıcı: Data curation, project administration, formal analysis, writing – review and editing

Conflict of Interest/Competing Interests

The authors declare that they have no conflict of interest

Availability of Data and Material

The dataset of this study are available from the corresponding author on reasonable request

Funding

The authors received no funding for the research, authorship and/or publication of this article from any government or private institution.

References

1. American Academy of Pediatrics; Section on Ophthalmology;American Association for Pediatric Ophthalmology and Strabismus; American Academy of Ophthalmology; American Association of Certified Orthoptists. Red reflex examination in neonates, infants, and children.Pediatrics2008; 122: 1401–4
2. Bremond-Gignac D, Copin H, Lapillonne A, Milazzo S;European Network of Study and Research in Eye Development. Visual development in infants: physiological and pathological mechanisms. Current Opin Ophthalmol .2011.Apr;22Supp:S1-8.
3. Committee on practice and ambulatory medicine; section on ophthalmology; American association of certified orthoptists; American association for pediatric ophthalmology andstrabismus; American Academy of ophthalmology. Visual System Assessment in Infants,Children, and Young Adults by Pediatricians. Pediatrics. 2016;137:1-3.
4. Balmer A, Munier F. Differential diagnosis of leukocoria and strabismus, first presenting signs of retinoblastoma. Clin Ophthalmol 2007; 1: 431-43
5. Can Yıldırım H, Erbaydar T. Van'da birinci basamakta çalışan hekimlerin göz hastalıklarına yaklaşımı ve uygulamaları. Türk Oftalmoloji Dergisi.2009.164-171.
6. Birch EE, Stager DR. The critical period for surgical treatment of dense congenital unilateral cataract. Invest Ophthalmol VisSci1996; 37: 1532–1538.
7. Yazgan H, Yıldırım A, Keleş E, et al. Assessing The effectiveness of the red reflex test (Brückner) in early diagnosis of congenital eye disorders. Turk Arch Ped 2012; 47: 163-164.
8. Magnusson G, Bizjajeva S, Haargaard B, et al. Congenital cataract screening in maternity wards is effective: evaluation of the Paediatric Cataract Register of Sweden. Acta Paediatr. 2013:102: 263–267.
9. Haargaard B, Nystrom, Rosensvard A, Tornqvist K, Magnusson G. The Paediatric Cataract Register (PECARE): analysis of age at detection of congenital cataract. Acta Ophthalmol. 2015: 93:24-26.
10. Özkurt Gürsel Z, Balsak S, Çamci MS, et al. Approach of family physicians to pediatric eye screening in Diyarbakır. Turk J Ophthalmol 2019;49:25-29
11. https://hsgm.saglik.gov.tr/depo/birimler/cocuk_ergen_db/dokumanlar/yayinlar/Kitaplar/02.08.2019_ULUSAL_GORME_TARAMASI_REHBERI.pdf
12. Toygar O, Öğüt MS, Kozakoğlu H. İstanbul'da İlköğretim çağı çocuklarında yapılan göz taraması sonuçları. Türk Oftalmoloji Dergisi.2003;33:585-591.
13. E.C Şener. Çocuk Göz Hastalıkları ve Şaşılık "Soruna yönelik".Güneş Tıp Kitabevi.2009.S:11-13.
14. Regassa TT , Daba TK , Fabian DI and Mengasha AA. Knowledge, attitude and practice of Ethiopian pediatricians concerning childhood eye diseases. BMC Ophthalmology.2021:21:91
15. Biten H, Koç EM, Özçelik DÇ, Kahveci R, Kasım İ, Şencan İ, Özkara A. Birinci basamakta göz hastalarına yaklaşımla ile ilgili aile hekimliği asistanlarının değerlendirilmesi. J Clin Exp Invest.2015;6(4):363-374
16. Toli A, Perente A, Labiris G. Evaluation of the red reflex: An overview for the pediatrician. World J Methodol 2021 September 20; 11(5): 263-277.
17. Eventov-Friedman S, Leiba H, Fiedel-Rimon O, Juster-Reicher A, Shinwell ES. The red reflex examination in neonates: an efficient tool for early diagnosis of congenital ocular diseases. IMAJ Isr Med Assoc J. 2010;12:259-261.