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Vision disability – glaucoma versus other causes

Visual disability is the third major health problem of mankind, following circulatory system diseases and tumours. Currently, an estimated 45 million of the blind live worldwide, with an increase of 1–2 million each year. An additional 135 million people have low vision. The majority of people with visual loss live in the developing countries (90%) and most of them suffer from either avoidable or curable blindness.

Regarding visual disability, it is necessary first to define its meaning according to Polish legislation. The most basic visual ability is the sense of light. It confirms proper functioning of optic nerve, proper conduction and perception. The loss of sense of light is equal to total blindness. Nevertheless, Polish law states that blind people are not only those who have lost any visual ability, but also those who have slight sense of light or partially useful sight abilities. A blind person is therefore either without any visual ability or has a thoroughly impaired sight ability. As blind we can qualify people with high or average disability resulting from dysfunction of vision apparatus. People with blindness in both eyes are qualified to the high degree of disability – visual acuity with ocular correction in the better eye does not exceed 5% of normal visual acuity, as well as patients with loss of visual field to 20 degrees of normal visual field. People with visual acuity with ocular correction in better eye between 6–10% of normal visual acuity, as well as people with the visual field narrowed to about 30 degree, are qualified to average degree of disability. People with a slight degree of visual disability are not considered as blind under Polish law (3, 4).

Current predictions suggest that the total number of cases of blindness will double by the year 2020 (10). The most significant factors related to this rise are both the increase in the world's population, and the increase in the proportion of the population aged 65 and above (11). As the rates of visual impairment increase according to age, the number of people with visual loss will inevitably rise. Overall, approximately 4% of persons aged 60 and above are thought to be blind.

One of the main causes of visual disability, especially in highly developed countries, is glaucoma. Over 67 million people over the world are suffering from it, and 6.5 million out of them are already blind (7). Glaucoma is a group of diseases in which the optic nerve is slowly destroyed. There are typical changes in the optic disc appearance (glaucomatous cupping), as well as progressing loss of visual field with usually high intraocular pressure. All types of glaucoma may lead to *glaucoma absolutum*. Total blindness, apart from other complications, can be the final outcome of untreated glaucoma.

Glaucoma was added by World Health Organisation (WHO) to the register of social diseases. It is the second cause of blindness in the USA (10% of all cases of blindness), in China (29.2%) and in Germany (22%), the third in England (11.6%) and in Australia (6%) (1, 2, 5, 8). In Poland over 700,000 people are affected by glaucoma. This number is constantly growing since there is no possibility of early detection or fully effective treatment. Moreover, there is no proper prophylactics. Over 80% of the affected are not aware that the process of becoming blind due to glaucoma is irreversible. Only 65,000 people suffering from glaucoma are treated. Although glaucoma as such cannot be prevented, its consequences of visual loss can be diminished if the disease is detected and treated early. Especially older people should have regular eye examinations, particularly those with family history of glaucoma.

The other major age-related causes of blindness and visual disability include: cataract (nearly 50% of all blindness), macular degeneration and diabetic retinopathy. With a predicted increase in the number of older people worldwide, these figures may soon reach even higher proportions. It is estimated that 80 out of every 100 new cases of blindness will be ageing-related.

Cataract causes gradual loss of vision and blindness, which is largely curable. Ageing-related cataract can be treated with a relatively simple operation to remove the opaque lens. This treatment is available in all countries, but is not always accessible for those who are poor or live in remote areas of developing countries. Diabetes is associated with damage to blood vessels in the retina, resulting in loss of vision. Diabetic retinopathy is the leading cause of blindness in adults in developed countries. After 15 years of suffering from diabetes, approximately 2% of people become blind, while about 10% develop severe visual disability. Regular eye examinations and timely treatment can prevent loss of vision in diabetic retinopathy. Age-related macular degeneration is the most common disorder in the group of non-avoidable causes of visual loss. It involves the progressive degeneration of a very light sensitive area of the retina, and is diagnosed in approximately 25% of people aged 80 and above. Although macular degeneration cannot be effectively treated, resulting visual disability can be alleviated by means of optical devices, rehabilitation and counselling. The demographic structure of visually disabled people is different from the structure of the whole society. Children and young people are the minority, while the population of people in late adulthood is the majority. One of the sources of information about people with visual disability in Poland is the data of Polish Society for the Blind (Pl.: *Polskie Towarzystwo Niewidomych*) (12). In the year 2002 it had 75,354 members including: people with high visual disability (46,850) and people with moderate visual disability (28,504). 5,002 persons were reported totally blind. 8,839 members had some additional serious disabilities, thus 5,763 suffered from diabetes mellitus. 56.4% of all members were women. The most common reasons of permanent both eyed vision loss in Poland for people aged 50 and above are: glaucoma (21%), diabetes (13%), degenerative changes in retina (12%); among women – glaucoma (17%), and diabetes (12.5%) among men (6).

Visual disability is also a serious problem in children. The number of visually disabled children in Poland has increased by 70% in the recent 10 years. The main causes of blindness and serious visual loss in the years 1979–1999 were: optic nerve atrophy (21.66%), retinopathy of prematurity (19.01%), cataracts (14.13%), high myopia (11.84%), congenital abnormalities (8.65%), retinal dystrophies (8.08%), and glaucoma (6.42%) (9). Great changes have been observed in epidemiology of blindness in children. In the last 20 years the percentage of visually disabled children extremely increased because of retinopathy of prematurity and optic nerve atrophy. That is why the main activities required to control blindness in Poland are prophylactics and promotion of health of pregnant women, prematurity care and improvements in early diagnosis and treatment of retinopathy of prematurity.

In the last 30 years a remarkable success in prevention of blindness resulting from xerophthalmia, onchocerciasis, and trachoma has been observed. External etiology is common for all these diseases. The possible causes such as infectious diseases or malnutrition lend themselves to a public health approach to control. The multisectoral campaign for the elimination of blinding trachoma consists of several components: surgery, antibiotics, and promotion (11). Effective preventive measures for the age-related diseases can only be established as more is known about their etiology. Wildly spread prophylactics programmes resulted in proclaiming the year 1999 as “the year of glaucoma in Poland”.

In view of the demographic transition the burden of disabling eye diseases will increase and require appropriate eye care services, particularly in developing countries. In collaboration with non-governmental organisations and other interested parties, WHO has recently launched the initiative “Vision 2020: A right to sight” with the objective to eliminate avoidable blindness by 2020.

It is believed that by the end of the 21st century, glaucoma will have been eradicated. With completion of the Human Genome Project all of genetic influences on glaucoma will be identified.

Technological breakthroughs, many of which are unimaginable today, will create radically new approaches to the diagnosis and treatment of eye diseases.

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SUMMARY

The article presents a review of the literature concerning causes of visual disability in Poland and worldwide. The main causes of age-related visual loss have been evaluated. Special attention was paid to glaucoma which is one of main reasons of irreversible and insidiously progressing blindness. Statistical data about the blind and the patients suffering from glaucoma have been recalled. Visual disability was defined according to Polish legislation. Special meaning of prophylactics was underlined.

Zaburzenia widzenia – jaskra a inne przyczyny

W pracy poglądowej zawarto dane z literatury, dotyczące przyczyn niepełnosprawności wzrokowej w Polsce i na świecie. Przedstawiono najważniejsze przyczyny utraty widzenia związanej z wiekiem. Szczególną uwagę poświęcono jaskrze, która jest jedną z głównych przyczyn nieodwracalnej i podstępnie postępującej ślepoty. Przywołano dane statystyczne dotyczące osób niewidomych jak również chorujących na jaskrę. Zdefiniowano niepełnosprawność wzrokową w kontekście polskiego ustawodawstwa. Zwrócono uwagę na szczególne znaczenie profilaktyki.