ORIGINAL ARTICLE

CONTENTS

Characteristic features of patients with myopia depending on the expressiveness of anxiety/depression

Volodymyr O. Drozdov
BRITISH OPHTHALMOLOGICAL CENTER, KYIV, UKRAINE

ABSTRACT

Aim: To determine the peculiarities of character traits of patients with myopia at different levels of anxiety and depression.

Materials and Methods: 30 patients with moderate myopia and mild myopic astigmatism in both eyes were examined. The "Kettel Test" was used to study the characteristics of the patient's character, and the Hospital Anxiety and Depression Scale was used to assess the levels of anxiety and depression. All examined patients were divided into 3 groups: the 1st group with a normal level of anxiety, the 2nd group with subclinical anxiety/depression, the 3rd group with clinically pronounced anxiety/depression. Mathematical processing of the research results was carried out using the methods of mathematical statistics.

Results: Characteristic features of patients with myopia include conservatism, restraint, subordination, anxiety, developed imagination and high self-control. In half of people with myopia, anxiety/depression is subclinically determined, and in a third – clinically expressed anxiety/depression is observed. In the absence of anxiety in patients with myopia, the main character traits were conservatism, restraint, subordination, sufficient normative behavior, high self-control, and self-confidence; in the presence of subclinical anxiety – sufficient self-control and normative behavior, sociability, developed imagination, conservatism; with clinically expressed anxiety and depression – developed imagination, anxiety, significant normative behavior, conservatism, restraint, subordination.

Conclusions: Studying the characteristic features of patients with myopia is necessary to clarify the peculiarities of the formation of the internal picture of the disease, the etiopathogenesis of the formation of nosogenies due to this pathology, and the development of individual psycho-corrective programs for such patients.

KEY WORDS: Character, anxiety, depression, myopia, etiopathogenesis, nosogenies, psycho-corrective programs

Wiad Lek. 2024;77(5):902-908. doi: 10.36740/WLek202405104 DOI

INTRODUCTION

Some projections suggest that by the year 2050, nearly 50% of the world's population could be myopic, with around 10% highly myopic [1]. In addition, the prevalence of high and potentially pathological myopia over -6D of myopia is of the order of 10 to 20% [2]. Myopia has been traditionally viewed as a consequence of the interplay between genetic, ethnic, and environmental risk factors. The following section highlights these risk factors: younger age at myopia onset, age normal cut-offs, myopic parents, Asian ethnicity, binocular vision disorders, and visual environment [3, 4].

R. Kaiti et al. [5], considering modern concepts of the development of myopia, emphasize that diet, socio-economic status [6], intelligence, and geography [7] are important risk factors for myopia. Myopia is associated with personality introversion, greater intelligence and cognitive abilities, and higher socioeconomic standards [8]. Several systemic diseases (albinism, Down's syndrome, Marfan's syndrome, Stickler's syndrome, dental caries, and diabetes) are also risk factors for the development of myopia [5].

R. Van de Berg et al. [9] say, that personality is defined as the system of enduring characteristics that contribute to consistency in an individual's thoughts, feelings, and behavior. It is widely accepted that personality is influenced by genetic and environmental factors [9]. However, the literature is inconclusive on links between personality and myopia. Numerous studies report that myopic persons tend to differ from nonmyopic persons along personality dimensions such as introversion/extroversion, passivity/anxiety, and abstractness/practicality [9]. In a review of the literature was concluded that myopic persons tend to be more introverted, tolerant to anxiety, and overcontrolled than nonmyopic persons [9].

T. Yokoi et al. [10] sought to determine the incidence of depression and anxiety disorders in patients with high myopia, as well as factors that would predict the development of psychiatric complications and their impact on vision-related quality of life. 205 patients with pathological myopia were examined. The frequency of depression was 22,0 %, and anxiety disorders – 25,9 %.

Table 1. Character traits in different groups of patients with myopia

Character traits (points)	Patients with myopia (M±m)		
	1st group N=6	2nd group N=15	3rd group N=9
A- sociability-closedness	5,95±0,49	6,48±0,26	5,40±0,24*
B- intellect	6,20±0,53	6,34±0,18	6,09±0,34
C- emotional stability	5,78±0,74	6,37±0,31	5,20±0,30**
E- independence-subordination	5,46±0,63	5,67±0,32	5,27±0,34
F- safety-concern	4,58±0,45	5,15±0,30	4,01±0,32**
G- the expressive force of «I»- unprincipledness	6,86±0,29	6,75±0,32	6,94±0,20
H- courage-timidity	5,70±0,74	6,39±0,25	5,08±0,31**
I- flexibility-stiffness	5,22±0,16	4,97±0,36	5,47±0,28
L- suspiciousness-credulity	5,87±0,28	6,24±0,39	5,55±0,44
M- practicality-rich imagination	6,12±0,19	6,03±0,35	6,21±0,37
N- flexibility-straightness	5,73±0,62	5,03±0,27	6,40±0,31***
O- anxiety-calm	6,31±0,37	5,81±0,24	6,79±0,33
Q1- radicalism-conservatism	3,55±0,27	3,41±0,35	3,73±0,38
Q2- conformism-nonconformism	5,76±0,27	5,54±0,33	6,01±0,37
Q3- high-low self-control	6,63±0,23	6,81±0,19	6,421±0,17
Q4- tension-relaxation	5,25±0,16	5,29±0,23	5,24±0,24

Notes: 2nd-3rd group *-p<0,05; **-p<0,01; ***-p<0,001.

Between 22 and 26 % of patients with high myopia had psychiatric disorders that had a strong negative impact on vision-related quality of life [10]. On the other hand, J. Łazarczyk et al. [11], evaluating patients with and without refractive abnormalities, showed that both myopic and hyperopic patients showed significantly less nonspecific anxiety and hostility compared to healthy subjects. Even today, this question is debatable, which became the purpose of this study.

AIM

To determine the peculiarities of character traits of patients with myopia at different levels of anxiety and depression.

MATERIALS AND METHODS

30 patients with myopia were examined at the British Ophthalmological Center in Kyiv. The clinical diagnosis of myopia was established by the Order of the Ministry of Health of Ukraine No. 827 dated 08.12.2015 [12], IMI – Clinical Management Guidelines Report. [13], Myopia control strategies recommendations from the 2018 WHO/IAPB/BHVI Meeting on Myopia [14]. All the studies were conducted according to implemented guidelines in consideration of GCP-ICH and the Declaration of Helsinki and current Ukrainian regulations [15, 16]. The study protocol was approved by the ethics committee of the National Medical University named after O.O. Bogomolets, Ministry of Health of Ukraine. The written informed consent was obtained from all the patients [17].

30 patients with moderate myopia and mild myopic astigmatism in both eyes were examined. 12 men and 18 women aged (M±m) 31,3 ± 5,7 years participated in the study. Independent distance visual acuity of the patients was (M±m) 0,04 ± 0,01 IU, and the maximum corrected visual acuity was (M±m) 0,87 ± 0,13 IU. The optical indicators of the eye were determined in conditions of cycloplegia using autorefractometry. Spherical refraction was (M±m) -4,27 ± 0,734 Dptr., and cylindrical – (M±m) -0,68 ± 0,52 Dptr; length of the anterior-posterior axis of the eye – (M±m) 25,31 ± 0,80 mm; thickness of the cornea in the central point – (M±m) 544,18 ± 29,73 μm.

The "Kettel Test" [18, 19] was used to study the characteristics of the patient's character, and the Hospital Anxiety and Depression Scale (HADS) [20] was used to assess the levels of anxiety and depression. We studied such character traits: sociability-closedness (A), intellect (B), emotional stability (C), independence-subordination (E), safety-concern (F), the expressive force of «I»- unprincipled ness (G), courage-timidity (H), flexibility-stiffness (I), suspiciousness-credulity (L), flexibility-straightness (N), anxiety-calm (O), radicalism-conservatism (Q1),

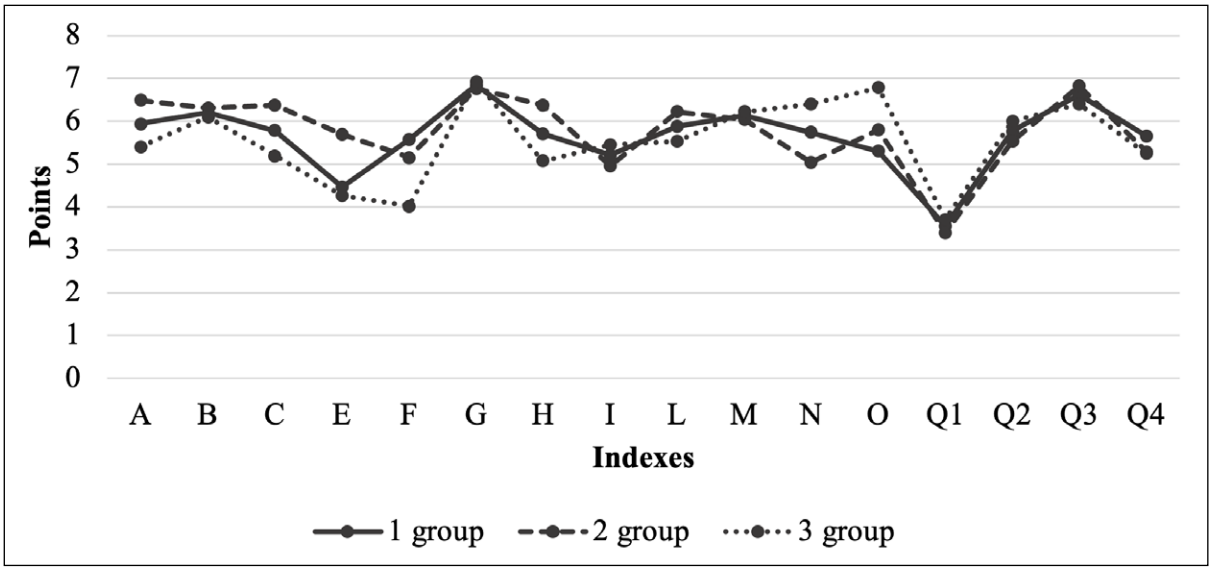

Fig. 1. Generalized profile of characterological features of patients of different groups with myopia

conformism-nonconformism (Q2), high-low self-control (Q3), tension-relaxation (Q4) [18, 19].

Depending on the level of anxiety/depression according to the Hospital Anxiety and Depression Scale (HADS), all examined patients were divided into 3 groups: the 1st group included 6 people (with a normal level of anxiety), the 2nd group involved 15 examined (with subclinical anxiety/depression), the 3rd group was made up of 9 patients (with clinically pronounced anxiety/depression).

Mathematical processing of the research results was carried out using the methods of mathematical statistics. The statistical description of the research indicators was carried out using the methods of primary statistical analysis [21]. We used the computer program «Statistica 7.0 for Windows». The quantitative indicators were presented as M±m. The quantitative data in the studied groups were compared by the use of the two-sample Student's t-test. It was considered that the average values of indicators differ significantly if the p-value did not exceed 0,05.

RESULTS

The generalized characterological profile of all patients with myopia was within the normal range and practically had neither low nor high scores. The highest indicators were +G (expressive strength of "I"-unprincipled), +Q3 (high-low self-control), +M (practicality-rich imagination); the lowest – -Q1 (radicalism-conservatism), -F (concern-security), -E (independence-subordination) (Table 1).

In all patients with myopia, conscious adherence to norms of behavior was observed, but sometimes there was a possibility of subordination to the case or circumstances (+G); discipline, accuracy in fulfilling social requirements, the ability to control one's emotions, take care of one's own public reputation (+Q3); sufficiently developed imagination, orientation to both the internal and external world, high creative potential (+M); conservatism, doubts about new ideas, tendency to moralize and preach (-Q1); prudence, caution, silence, tendency to complicate everything, some preoccupation, pessimistic perception of reality, expectation of failure, fears about the future (-F). That is, the leading characterological features of patients with myopia were conservatism, restraint, subordination, anxiety, developed imagination, and high self-control.

The 86,7 % of those examined had anxious thoughts, 80 % felt fear, 73,3 % complained of feelings of anxiety, 66,7 % felt internal tension, 53,3 % were not satisfied with life, 33,3 % – did not feel cheerful, 26,6 % – complained about slowness of actions, 30,0 % noted the lack of satisfaction with their affairs, 16,6 and 20,0 % – lack of meaning and job satisfaction In 20 % of patients, the level of anxiety/depression according to the Hospital Anxiety and Depression Scale (HADS) is 6,54 points, in 50 % – 8,73 points, in 30 % – 13,56 points. That is, 50 % of patients with myopia were diagnosed with subclinically expressed anxiety/depression, and 30 % with clinically expressed anxiety/depression.

In patients with myopia in the absence of anxiety and depression (the 1st group), the highest indicators were +G (expressive strength of «I» – unprincipled), +M (practicality – rich imagination), +Q3 (high-low self-control), and the lowest – -Q1 (radicalism-conservatism), -E (independence-subordination), -I (flexibility-rigidity) (Table 1).

They were characterized by compliance with norms and rules, which they sometimes violated under certain circumstances, efforts to act by their own value preferences (+G); sufficiently developed imagination, orientation to both the inner world and external reality, high creative potential (+M); discipline, strict adherence to social requirements and rules, the ability to control one's emotions, concern for one's own social reputation (+Q3); conservatism, resilience in the face of difficulties, doubts about new ideas, tendency to moralize and teach others (-Q1); shyness, tendency to give way to others, dependence, self-blame, tact, submissiveness, to complete passivity (-E); excessive self-confidence and independence, mannerism, skepticism, cynicism, pragmatism (-I).

The leading characterological features of such persons were conservatism, restraint, subordination, sufficient normativity of behavior, high self-control, and self-confidence.

In patients with subclinical anxiety/depression (50,0% of the examined – the 2nd group), the highest indicators were +Q3 (high-low self-control), +G (expressive strength of "I" – unprincipled), +A (sociability-closedness), +M (practicality-rich imagination); the lowest- Q1 (radicalism-conservatism) (Fig. 1).

Discipline, compliance with social requirements, the ability to control one's emotions, care for one's social reputation (+Q3); conscious observance of norms and rules of conduct, perseverance in achieving the goal, accuracy, responsibility, business orientation (+G); sociability, good-naturedness, openness, kind-heartedness, naturalness and ease of behavior, attentiveness, benevolence, sincerity in relationships, active in resolving conflicts, trustworthiness, experiencing bright emotions, lively response to any event (+A); sufficiently developed imagination, orientation to both the inner world and external reality, high creative potential (+M); conservatism, resilience in the face of difficulties, doubts about new ideas, tendency to moralize and teach others (-Q1).

The leading characterological features of these patients were high self-control, sufficient normativity of behavior, sociability, developed imagination and conservatism.

A third of the examined patients who were diagnosed with clinically significant anxiety/depression (the 3rd group) are characterized by +M (practicality-rich imagination), +O (anxiety-calm), +G (expressive strength of "I"- unprincipledness) and -Q1 (radicalism-conservatism), -E (independence-subordination), -F (concern-security) (Fig.). Persons with myopia and severe anxiety/depression had a statistically significant decrease in levels of A- sociability-closedness – on 16,7 % ($p<0,05$), C- emotional stability – on 18,3 % ($p<0,05$), F- safety-concern – on 22,1 % ($p<0,01$), H-courage-timidity – on 20,5 % ($p<0,01$), and increase of N- flexibility-straightness – on 27,2 % ($p<0,01$) (Table 1).

These individuals were distinguished by sufficiently developed attention, orientation both to the inner world and to external reality, sufficient creative potential (+M), insecurity, anxiety, depression, vulnerability (+O), a tendency to consciously observe norms and rules, but sometimes and to impulsive behavior, the desire to adhere to one's own's value guidelines (+G), conservatism, stability with traditional life difficulties, doubts about new ideas, a tendency to demoralize and teach (-Q1), shyness, a tendency to give way to others, dependence, preoccupation the possibility of mistakes, tact, submissiveness to complete passivity (-E), prudence, carefulness, silence, a tendency to complicate everything, preoccupation, pessimistic perception of reality, anxiety about the future, expectation of failure (-F).

The leading characterological features of patients with myopia and severe anxiety/depression included developed imagination, anxiety, significant normative behavior, conservatism, restraint, and subordination.

That is, the leading characterological features of patients with myopia were conservatism, restraint, subordination, anxiety, developed imagination, and high self-control.

50 % of patients with myopia were diagnosed with subclinically expressed anxiety/depression, and 30 % with clinically expressed anxiety/depression. 86,7 % of those examined had anxious thoughts, 80 % felt fear, 73,3 % complained of anxiety, 66,7 % felt internal tension, 53,3 % were not satisfied with life, 33,3 % did not feel cheerful, 26,6 % – complained about the slowness of actions, 30,0 % noted lack of satisfaction with their affairs, 16,6 and 20,0 % – lack of meaning and satisfaction from work.

The leading characterological traits of persons with myopia and a normal level of anxiety were conservatism, restraint, subordination, sufficient normative behavior, high self-control, and self-confidence.

Patients with myopia and subclinical anxiety/depression can be characterized as highly self-controlled, with sufficient normativity of behavior, sociable, with a developed imagination, and conservative. In the conducted study, we did not find statistically significant differences between persons with a normal level of anxiety and subclinically expressed anxiety depression, which may be related to the small size of the group.

In patients with myopia and severe anxiety/depression, it is possible to note a developed imagination, anxiety, significant normative behavior, conservatism,

restraint, and subordination. However, significant differences in character traits were observed in patients with myopia of 2nd and the 3rd groups. Persons with myopia and severe anxiety/depression had a statistically significant decrease in levels of A- sociability-closedness – on 16,7 %, C- emotional stability – on 18,3 %, F- safety-concern – on 22,1 %, H- courage-timidity – on 20,5 %, and increase of N- flexibility-straightness – on 27,2 %. The obtained results indicate the need for further research on the prevalence of mental and behavioral disorders in patients with myopia.

DISCUSSION

Globally 22,9 % of the population had myopia and 2,7 % had high myopia in 2000, and projects that these figures will increase to 49,7 % and 9,8 %, respectively by 2050. It is estimated that in 2020 2,6 billion live with myopia and is estimated to increase to 4,7 billion by 2050; almost half the global population [11, 22]. Myopia prevalence has significantly increased from 79,5 % to 87,7 %; moderate myopia (38,8 % to 45,7 %), severe myopia (7,9 % to 16,6 %), and terminal myopia (0,08 % to 0,92 %) [11, 22]. The statistics suggest an alarming increase in myopia prevalence globally, rendering it a burden in public health [11].

Trait anxiety is defined by Spielberger as a theoretical construct, that "is a motive or acquired behavioral disposition, that predisposes a person to perceive a wide range of objectively non-dangerous (physically or psychologically non-dangerous) circumstances as threatening to respond to these anxiety reactions disproportionate in intensity and magnitude of the objective danger" [9-11, 23].

Numerous reviews and studies have reported that people with myopia differ from people without myopia on personality parameters such as introversion/extroversion, passivity/anxiousness, and abstractness/practicality [11]. J. Łazarczyk et al. emphasize that R. Lanyon, J. Giddings found that myopic patients are more withdrawn, embarrassed and self-centered, and less open in their social relationships; they have fewer friends [11]. In the study of A. Kalkan et al. found that patients with myopia have statistically significant lower scores on the low traits of goal-directedness, willingness to cooperate, empathy, willingness to help, and compassion compared to normal patients [24]. Self-directedness, empathy, and willingness to help were significantly lower in patients with myopia compared to individuals with myopic astigmatism. However, other studies do not indicate significant differences in personality characteristics between myopic and non-myopic people [25].

A number of studies have shown that such eye diseases as amblyopia and strabismus negatively affect the mental state of patients. People with amblyopia had higher levels of somatization, obsessive-compulsive disorder, interpersonal sensitivity, depression, and anxiety compared to controls [11]. J. Horwood et al. indicate that the sense of victimhood that arose in early childhood can be associated with psychosocial maladjustment and causes anxiety, depression, loneliness, and low self-esteem. Visual defects, such as strabismus or amblyopia, have been associated with impaired interpersonal relationships and low self-esteem [11, 26, 27].

Anxiety disorders and depressive disorders are among the most common disorders experienced by young people and may later contribute to the development of anxiety disorders in adults [10]. T. Yokoi et al. sought to determine the incidence of depression and anxiety disorders in patients with high myopia, as well as factors that would predict the development of psychiatric complications and their impact on vision-related quality of life. The frequency of depression was 22,0 %, and anxiety disorders – 25,9 %. Between 22 and 26 % of patients with high myopia had psychiatric disorders that had a strong negative impact on vision-related quality of life [10].

CONCLUSIONS

1. Characteristic features of patients with myopia include conservatism, restraint, subordination, anxiety, developed imagination, and high self-control.
2. In half of people with myopia, anxiety/depression is subclinically determined, and in a third – clinically expressed anxiety/depression, is expressed in an increase in anxious thoughts, increased fear, a feeling of anxiety, and internal tension. Half of the patients were not satisfied with life, did not feel cheerful, and complained about the slowness of actions, lack of meaning, and satisfaction from work.
3. In the absence of anxiety in patients with myopia, the main character traits were conservatism, restraint, subordination, sufficient normative behavior, high self-control, and self-confidence; in the presence of subclinical anxiety – sufficient self-control and normative behavior, sociability, developed imagination, conservatism; with clinically expressed anxiety and depression – developed imagination, anxiety, significant normative behavior, conservatism, restraint, subordination.
4. There were significant differences in character traits were observed in patients with myopia of subclinical and severe anxiety/depression. Persons with myopia

and severe anxiety/depression had a statistically significant decrease in levels of sociability-closedness (A) – on 16,7 %, emotional stability (C) – on 18,3 %, safety-concern (F) – on 22,1 %, courage-timidity (H) – on 20,5 %, and increase of flexibility-straightness (N) – on 27,2 %.

5. Studying the peculiarities of the character of patients with myopia is necessary to clarify the etiopathogenesis of the formation of nosogenies due to this pathology, the peculiarities of the formation of the internal picture of the disease, and the development of individual psychocorrective programs for such patients.

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The results of the study were obtained by the authors during the research work of the Department of Ophthalmology of National Medical University named after O.O. Bogomolets of the Ministry of Health of Ukraine «Improving diagnosis and treatment of pathology of the retina and optic nerve vascular, traumatic and endocrine genesis» (state registration № 0120U100810; term: 2021-2023 years).

CONFLICT OF INTEREST
The Author declare no conflict of interest

CORRESPONDING AUTHOR
Volodymyr O. Drozdov
British Ophthalmological Center
3A, Uzviz Krutyy, 01004 Kyiv, Ukraine
e-mail: kiev@eyes.ua

ORCID AND CONTRIBUTIONSHIP
Volodymyr O. Drozdov: 0000-0001-6565-5858 A B C D E F

A – Work concept and design, B – Data collection and analysis, C – Responsibility for statistical analysis, D – Writing the article, E – Critical review, F – Final approval of the article

RECEIVED: 10.12.2023
ACCEPTED: 23.04.2024