Suhe oči, problemi s vidom i psihijatrijski simptomi: propuštamo li nešto?

/ Dry Eyes, Vision Problems, and Psychiatric Symptoms: Are We Missing Something?

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Problemi vida i patologija oka često su u komorbiditetu s psihijatrijskim stanjima. Ovaj rad pruža pregled dostupnih istraživanja o takvim vezama i podiže osviješćenost o mogućem značenju i učincima različitih očnih simptoma i oštećenja vida na psihijatrijska stanja i psihičke simptome. Dodatno, psihološke karakteristike i psihijatrijska stanja razmatraju se kao mogući uzroci problema oka i vida. Većina istraživanja otkriva povezanost između problema oka i vida s psihijatrijskim stanjima i psihičkim smetnjama. Blaži oftalmološki problemi najčešće su povezani s poremećajima raspoloženja, a manje s ostalim psihijatrijskim stanjima. Ozbiljni oftalmološki problemi, poput gubitka oštrine vida, povećavaju rizik za reaktivnu depresiju. Manji broj istraživanja potvrđuje vezu između psihotičnih poremećaja i vida, koja uglavnom mijenja vidnu percepciju. Zaključno, razmotrene su moguće interakcije i odnosi između psihijatrijskih stanja i problema oka i vida te preporuke za buduća istraživanja. U preporukama za usmjeravanje i zbrinjavanje pacijenata naglašen je holistički pristup u tretmanu pacijenata.

/ Vision problems and eye pathology are often comorbid with psychiatric conditions. This paper provides a review of available studies about these associations and raises awareness on possible causes and impacts of different eye symptoms and vision impairment on psychiatric states and psychological symptoms. Additionally, psychological characteristics and psychiatric conditions are considered as a possible cause of eye and vision-related problems. Most of the studies found an association of eye and vision problems with psychiatric conditions and psychological disturbances. Ophthalmic problems of a milder nature are mostly associated with mood disorders and less commonly with other psychiatric conditions. Serious eye conditions, like a loss of visual acuity, increase the risk for reactive depression. Fewer studies presented a connection between psychotic disorders and vision, which mostly alters visual perception. In the concluding section, possible interactions and relationships between psychiatric conditions and eye and vision problems are presented, along with recommendations for future research. The importance of holistic professional care in patient treatment is particularly emphasized in the recommendations for patient management.

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UVOD

Psihijatrijski poremećaji mogu imati oftalmološke manifestacije. Poznato je da teška psihijatrijska stanja poput shizofrenije mijenjaju percepciju stvarnosti i utječu na vidnu kogniciju. Mehanizam koji uzrokuje takve aberacije još nije u potpunosti poznat. Međutim, kod poremećaja raspoloženja relativno česti očni simptomi, poput bolnih očiju, umora ili suhoće oka, uglavnom prođu nezapaženi ili su zanemareni, iako mogu barem djelomično uzrokovati psihijatrijske smetnje. Takvi simptomi mogu narušiti kvalitetu života i na taj način pridonijeti psihološkim problemima. Poteškoće vida zasigurno utječe na kvalitetu života (1) i po svojoj prilici izazivaju depresiju koja kod pacijenata često prolazi nezapaženo (2). Gotovo polovica brojnih pacijenata očnih klinika različitih oftalmoloških dijagnoza moglo bi imati poremećaje raspoloženja (3).

Psihološke i očne smetnje se, bez sumnje, često primjećuju zajedno. Neke od njih su toliko dojmljive da se pretpostavlja i raspravlja o posebnim psihijatrijskim stanjima. Najbolji primjer toga je keratokonusna ličnost o kojoj se još uvijek debatira i još nije potvrđena (4).

Sindrom suhog oka (SSO) jedan od zdravstvenih problema očiju koji je u najvećem porastu i zahvaća trećinu opće populacije (5), u posljednjem je desetljeću često povezivan s različitim psihološkim čimbenicima (6-18).

Trijažni dijagnostički postupci otkrivaju da samo 22,7 % pacijenata sa suhim okom otpornih na terapiju nema simptome psihičkih poremećaja (19). Simptomi suhog oka uže su povezani s psihičkim simptomima i ne-okularnom boli, nego s objektivnim parametrima suznog filma (6). Shimura, Shimazaki i Tsubota (20) su na velikom uzorku usporedili pozitivno i negativno dijagnosticirane pacijente prema njihovim izvješćima o simptomima SSO-a. Svaka osoba s pozitivnom dijagnozom izvjestila je barem o nekim od simptoma, a samo je 14 %

INTRODUCTION

Psychiatric disorders can have ophthalmologic manifestations. Severe psychiatric conditions like schizophrenia are known to alter the perception of reality and affect visual cognition. The mechanism that causes such aberrations is not yet completely known. However, relatively common eye symptoms in mood disorders like eye pain, fatigue, or dryness, are generally unnoticed or disregarded but may at least partially cause psychiatric disturbances. These symptoms can disturb the quality of life and thus contribute to psychological problems. Vision impairment certainly affects the quality of life (1) and is likely to cause depression which is mostly undetected among patients (2). Almost half of the numerous eye clinic patients with different ophthalmic diagnoses may have a possible mood disorder (3).

Psychological and eye disturbances are, without a doubt, frequently noticed together. Some of them are so striking that special psychiatric states have been discussed and hypothesized. The best example is keratoconus personality, which is still under debate and has not yet been confirmed and a separate entity (4).

Dry eye disease (DED) is one of the most rapidly increasing eye health problems which affects one-third of the general population (5) and has been frequently associated with a variety of psychological factors in the last decade (6-18).

Screening diagnostic procedures reveal that only 22.7% of therapy-resistant patients with dry eye are not diagnosed with symptoms of psychological disorders (19). Dry eye symptoms were more closely associated with psychological symptoms and non-ocular pain than with objective tear film parameters (6). Shimura, Shimazaki, and Tsubota, (20) compared the self-reported symptoms of DED between positively and negatively diagnosed groups in a large sample. Every positively diagnosed person reported at least some of the symptoms, but only 14% of the negatively diagnosed had no symptoms at all. Almost the same symptoms were listed as the top five most

negativno dijagnosticiranih bilo bez simptoma uopće. Gotovo isti simptomi navedeni su kao pet najčešćih u obje skupine s time da je umor očiju bio na prvom mjestu (kod 80 % pozitivno i 42 % negativno dijagnosticiranih). Svi ovi rezultati upućuju na drugačije uzroke očnih problema koji nadilaze patofiziologiju oka, a neki od njih mogli bi biti i psihološki.

SSO sasvim sigurno nije jedini problem oka povezan sa psihičkim problemima. Različite vrste problema vida i oka mogu uzrokovati psihijatrijske simptome. Neki od njih su prilično neočekivani, poput velikog postotka poremećaja spavanja (37,4 %) kod pacijenata s različitim očnim problemima (3). Međutim, čini se da je SSO ipak najčešće u komorbiditetu s psihološkim smetnjama i najbolje je istražen. Ovaj pregled će se stoga najviše usredotočiti na SSO zbog njegove relevantnosti za psihičke simptome, ali će se baviti i nekim drugim mogućim problemima oka i vida u vezi s psihičkim smetnjama.

SVRHA

Ovaj rad daje pregled empirijskih dokaza iz dostupne literature o povezanosti problema oka i vida s psihičkim poremećajima.

Posebni cilj ovog pregleda je povećati osviještenost o mogućim značenjima i utjecaju očnih simptoma i oštećenja vida na psihijatrijska stanja, psihičke simptome i opću kvalitetu života. Drugi cilj je predočiti znanstvene dokaze da se psihološke karakteristike i psihijatrijska stanja mogu razmatrati i kao mogući uzroci problema oka i vida. Oba cilja bi trebala naglasiti važnost bavljenja s ovim simptomima holističkim pristupom tretmanu pacijenata.

Shizofrenija

Neke od očnih smetnji kod pacijenata sa shizofrenijom, poput abnormalnog treptanja i pokreta očiju, dugo vremena su poznate u

frequent in both groups, with eye fatigue in the first place (80% of positively diagnosed and 42% of the negatively diagnosed group). These results suggest the existence different causes of ocular problems other than eye pathophysiology, some of which may be psychological.

DED is certainly not the only eye problem associated with psychological problems. Different kinds of visual and eye problems can lead to psychiatric symptoms. Some of them are quite unexpected, like a surprisingly large percentage of sleep disturbances (37.4 %) in patients with different eye problems (3). However, DED appears to be the most common comorbidity with psychological disturbances and has been most widely studied. That is why this review will mostly focus on DED and its relevance to psychological symptoms but will also address some other possible eye and vision problems associated with psychological disturbances.

PURPOSE

This paper provides a review of empirical evidence from available literature about associations between eye and vision problems and psychological disturbances.

A special goal of this review is to raise awareness of the possible causes and impacts of eye symptoms and vision impairments on psychiatric states, psychological symptoms, and general quality of life. Another goal is to present the scientific evidence that psychological characteristics and psychiatric conditions can also be considered as the possible cause of eye and vision-related problems. Both goals should emphasize the importance of dealing with these symptoms in a holistic approach to the treatment of patients.

Schizophrenia

Some of the ocular disturbances in patients with schizophrenia, like abnormal blinking and eye movements, have been known in psy-

psihijatriji i mogu se povezati s različitim fazama bolesti. Akutna pogoršanja u shizofreniji povezana su sa smanjenim treptanjem, kod kronične shizofrenije zbog mirovanja simptoma treptanje je kontinuirano u porastu, a zog psihotičnih epizoda javlja se naglo i napadno brzo, ritmično treptanje (21).

Zurenje ili izbjegavanje kontakta očima može se javiti zbog perceptivnih promjena kod pacijenata koji nisu pod terapijom lijekovima (21).

Još od prvih prepoznavanja shizofrenije kao psihijatrijskog poremećaja, poznato je da shizofrenija značajno mijenja vidnu percepciju i kogniciju (22). Mehanizme ovih odstupanja često je teško razdvojiti. Pacijenti sa shizofrenijom često doživljavaju perceptivne anomalije, koje nisu isto što i halucinacije i slični pozitivni psihotični simptomi poput povećanja kontrastne osjetljivosti koja se javlja i kod tek dijagnosticiranih i neliječenih pacijenata (23), ali i kod pacijenata liječenih psihofarmacima (24). Pojedini istraživači navode i odstupanja u perceptivnom procesiranju kontekstualnih efekata (25), pokreta (26) i boja (27).

Silverstein i Rosen (27) su razmatranjem različitih poremećaje vidne percepcije u shizofreniji donijeli nekoliko glavnih zaključaka. Višestruke strukturne i fiziološke promjene u očima izravno su povezane sa shizofrenijom, lijekovima ili pak komorbiditetom s drugim medicinskim stanjima. Ekscesivne i smanjene dopaminske aktivnosti u mozgu pacijenata sa shizofrenijom mogu se također pojaviti i u njihovim mrežnicama i tako imati značajnu ulogu u smetnjama vizualne obrade. Promjene u retinalnoj strukturi i funkciji mogu poslužiti kao biomarkeri shizofrenije. Mnoštvo naprednih dijagnostičkih metoda i tehnika u oftalmologiji, poput optičke koherencijske tomografije (OCT), elektroretinografije (ERG) ili digitalnog snimanja mrežnice, može dati nalaze upotrebljive kao neizravne mjere kognitivnog funkcioniranja i oštećenja, te razvoja bolesti. Još jedan klinički znak, disfunkcija pokreta očiju (EMD),

chiatry for a long time and can be associated with the different stages of illness. Acute exacerbations of schizophrenia are associated with a decrease of blinking, whereas in chronic schizophrenia with resting symptoms blinking continuously increases, and sudden and rapid rhythmical blinking occurs during the psychotic episodes (21).

Staring or avoiding eye contact may occur due to perceptual change in unmedicated patients with schizophrenia (21).

Since the first recognition of schizophrenia as a psychiatric disorder, it has been well-known that schizophrenia significantly alters visual perception and cognition (22). Mechanisms of these alterations are often difficult to separate. Patients with schizophrenia often experience perceptual anomalies different from hallucinations and other positive psychotic symptoms such as an increase in contrast sensitivity which occurs in both unmedicated newly diagnosed (23) and medicated patients (24). Researchers also reported aberrations in contextual effects (25), abnormal motion processing (26), and color processing (27).

Silverstein and Rosen (27) considered different visual perception disturbances in schizophrenia and reached a few major conclusions. Multiple structural and physiological changes in the eyes are directly related to schizophrenia, medication, or comorbidity with other medical conditions. Dopamine activity excesses and reductions in the brain of patients with schizophrenia are also likely to occur in their retinas and thus play a significant role in visual processing disturbances. Changes in retinal structure and functions can serve as biomarkers of schizophrenia. Many advanced diagnostic methods and techniques in ophthalmology like optical coherence tomography (OCT), electroretinography (ERG), or digital retinal imaging can provide results useful as indirect measures of cognitive functioning and impairment and disease development. Another clinical sign, eye movement

pod određenim metodološkim uvjetima može poslužiti kao biološki marker za shizofreniju s obzirom da je velika prevalencija te disfunkcije prisutna kod bolesnika sa shizofrenijom i njihovih srodnika prvog stupnja (28).

Mnoge studije izvještavaju o pogoršanju finih pokreta očnog pretraživanja kod pacijenta sa shizofrenijom (21,29) koje može poslužiti čak i kao genetički marker shizofrenije (30). Ljudi sa shizofrenijom u odnosu na ostale pokazuju i različiti glabelarni refleks. Na glabelarno tapkanje treptaji izostaju i javljaju se u paroksizmalnim naletima ili pak izostaje habituacija refleksa, ovisno o fazi poremećaja (21,31).

Psihološko testiranje otkriva povećanu razinu shizofrenih simptoma kod muškaraca i žena s keratokonusom u usporedbi s kontrolnom skupinom bez keratokonusa (32). Pacijenti s keratokonusom na glasu su da slabo poštuju stručnjake za zdravlje oka, odbijaju suradnju i ne pridržavaju se plana liječenja, te se prije svega u terminima ličnosti često opisuju kao neobični (33).

Koliko je poznato, nema istraživanja koja su ispitivala vezu između SSO-a i shizofrenije. Osim što ima određenih neizravnih zapažanja da infracrvena skleralna refleksija (IR), dijagnostička tehnika za detekciju EMD u shizofreniji, može izazvati iritaciju i sušenje oka i time rezultirati povećanom frekvencijom treptanja (28).

Imajući u vidu određenu patologiju oka specijalisti za zdravlje očiju mogu identificiranjem dostupnih kliničkih znakova imati važnu ulogu u ranoj dijagnostici shizofrenije i slične psihopatologije, a pravilnom njegom očiju mogu se ublažiti neke perceptivne anomalije i posljedično poboljšati kvaliteta života psihijatrijskih pacijenata.

Depresija

Problemi oka ili vida mogu uzrokovati reaktivnu depresiju. Većina starijih slabovidnih pacijenata zadovoljava kriterije za veliki depresivni

dysfunction (EMD), may serve as a biological marker for schizophrenia under certain methodological conditions since a high prevalence of it is present in patients with schizophrenia and their first-degree relatives (28).

Many studies have reported impaired smooth pursuit eye movements in patients with schizophrenia (21,29) which can even serve as a genetic marker of schizophrenia (30). People with schizophrenia also display different glabellar reflex than others. Blinking in response to glabellar tapping is either absent, occurs in the paroxysmal bursts, or fails to habituate depending on the phase of the disorder (21,31).

Psychological testing revealed increased levels of schizophrenia in patients with keratoconus, both in women and men, compared with controls without keratoconus (32). Keratoconus patients are known to be less respectful of eye care providers, uncooperative, and noncompliant with treatment plans, and above all are often described as unusual in terms of personality (33).

To the best of our knowledge, there have been no studies that examined the association between DED and schizophrenia. There were only some indirect observations that infrared scleral reflection (IR), a diagnostic technique for detection of EMD in schizophrenia, can irritate and dry eyes and thus result in increased blinking frequency (28).

With a certain eye pathology in mind, eye care specialists may play an important role in early diagnosis of schizophrenia and similar psychopathology by identifying available clinical signs, and proper eye care might mitigate some altered perceptual symptoms and consequently improve the quality of life of psychiatric patients.

Depression

Eye or vision problems may cause a reactive depression. Most older patients with low vision meet the criteria for major depression (34). Older adult male patients with vision impair-

poremećaj (34). Stariji odrasli muški pacijenti s oštećenjima vida posebno su rizični (35). Pacijenti s glaukomom pokazuju najteže depresivne simptome (3), a depresija je prisutna i kod pacijenata s keratokonusom (36).

Stariji pacijenti s kataraktom, najčešćim uzrokom oštećenja vida, često su skloni depresiji. Za očekivati je da operacija katarakta može smanjiti simptome depresije. Međutim, kirurški zahvat ne smanjuje depresiju kod tih pacijenata (37). Drugi rezultati pokazuju da depresija povezana s oštrinom vida kod katarakte ovisi samo o ishodu operacije. Ako rezultira poboljšanjem oštrine vida, depresija se smanjuje, a ako se oštrina vida pogoršava, pogoršava se i depresija (38).

Uzevši ove rezultate u obzir možemo razmotriti nekoliko mogućih zaključaka o povezanosti depresije i katarakte: 1) koegzistiraju zbog još nepoznatih čimbenika; 2) moguće je da katarakta nema uzročne učinke na depresiju, ali da percepcija mogućeg oštećenja vida ima; 3) katarakta se razvija sporo, pa je moguće da su promjene u oštrine vida suviše postupne da bi izazvale naglu pojavu depresivnih simptoma.

Blaži problemi oka također mogu rezultirati depresivnim simptomima. SSO, osobito s čestim zamućenjem vida, povezan je sa simptomima depresije (39), jer nestabilnost suznog filma tipična za suho oko može izazvati optičke aberacije. Stanje suhog oka uključuje promjene u funkciji i sastavu suza te pogoršava kvalitetu i performanse vida što može dovesti do depresije (14). Općenito, SSO je često povezivan s depresijom, što je dobro potvrđeno na različitim uzorcima (3,6,11,14-18,35,39-43) uključujući i velike (44,45). Neki od rezultata čak pokazuju da je SSO dominantno povezan s porastom simptoma depresije u usporedbi s različitim poremećajima oka (9).

Unatoč prevladavajućim dokazima da su problemi oka poput oštećenja vida mogući uzrok reaktivne depresije, postoje dokazi da je moment are particularly at risk (35). Patients with glaucoma reach the highest scores in depression (3). Depression is also present in keratoconus patients (36).

Older patients with cataracts, the most frequent cause of vision impairment, are often prone to depression. It is reasonable to expect that cataract surgery may decrease depressive symptoms. However, the surgery does not reduce depression in those patients according to one study (37). Other results found that depression related to visual acuity in cataract cases depends only on the outcome of the surgery. If it results in improvement of visual acuity, depression decreases, and if the visual acuity worsens so does depression (38).

Looking at these results, we can consider few conclusions about the relation between depression and cataracts: 1) They coexist due to yet unknown factors; 2) it is possible that cataracts have no causal effects on depression, but the perception of possible impairment does, and 3) given the fact that cataracts are developing slowly, it is possible that the changes in visual acuity are too gradual to cause rapid expression of depressive symptoms.

Even milder eye problems may result in depressive symptoms. DED, especially with a high frequency of visual blurring, is associated with symptoms of depression (39). Visual bluring is due to tear instability typical for dry eye conditions which can induce the optical aberrations. The dry eye condition includes tear-related changes and worsens visual performance and quality that may lead to depression (14). Generally, DED is quite often associated with depression as has been well-confirmed in many different samples (3,6,11,14-18,35,39-43) as well as in very large ones (44, 45). Some results even indicate that DED is also dominantly associated with an increase of depression symptoms in comparison with different ocular disorders (9).

Despite prevailing evidence that eye problems like vision impairment are a possible cause of reactive depression, there is also empirical

guće i suprotno. Sklonost depresiji može uzrokovati da se problemi vida percipiraju lošijima nego što realno jesu ili čak uzrokovati takve probleme. Teško depresivni pacijenti skloni su percipirati okolinu mračnijom u usporedbi s umjereno i blago depresivnim pacijentima (46). Imaju i smanjenu osjetljivost subjektivne percepcije kontrasta koja bi mogla biti posljedica promjena dopaminergičke aktivnosti u mozgu (47). Ove perceptivne promjene mogu se objektivno mjeriti u očima i na taj način poslužiti kao biološki biljezi depresije, iako njihova uzročna priroda još nije sasvim poznata (48).

Prilično neočekivano, rizik od pojave depresivnih simptoma ne povećava se smanjenjem oštrine vida, nego sa subjektivnom percepcijom vizualne disfunkcije (35). Kada je u pitanju SSO, depresija može povećati osjetljivost na percepciju simptoma suhog oka (49). Povišeni simptomi depresije prisutni su zajedno s jasno subjektivnim simptomima suhog oka poput zamućenja vida, ali ne i s objektivnim rezultatima testova za suho oko (39). Slični rezultati pronađeni su i u drugim istraživanjima (35,40,41). Dio rezultata ukazuje da neliječeni, novo-dijagnosticirani pacijenti s depresijom ne pokazuju depresivne i anksiozne rezultate psihološkog testiranja u značajnoj vezi sa samoprocjenom simptoma suhog oka (50), ali ti rezultati još nisu replicirani.

Za sada nije jasno jesu li ozbiljni simptomi SSO-a mogući uzrok depresije kod postojanja kronične boli i negativnog učinka na svakodnevne aktivnosti, ili depresija i primijenjeni lijekovi uzrokuju SSO, ili je pak neki drugi faktor uzrok simptoma oba poremećaja (41), što je i moguće jer imaju iste rizične čimbenike (49).

Dodatna potvrda da depresija može uzročno djelovati na oko, barem u slučaju SSO-a je činjenica da kronična depresija može pospješiti proizvodnju protuupalnih citokina i tako pogoršati simptome SSO-a (49). Galor i dr. su predložili da je povezanost između DED i depresije i PT-

support that the relationship may be in the other direction. Tendency to depression may cause visual problems to be perceived as worse than they really are or even be the cause of it. Severely depressed patients are more likely to perceive their ambient environment dimmer than usual in comparison with moderately and mildly depressed patients (46). They also experience reduced sensitivity of subjective contrast perception which might be due to altered dopaminergic neurotransmission (47). These perceptual alterations can be measured objectively in the eyes and thus provide measurable markers of depression, but the causal nature of this phenomenon is still unknown (48).

Rather unexpectedly, risk of having depressive symptoms does not increase with a decrease in visual acuity, but rather with the subjective perception of visual dysfunction (35). In the case of DED, depression can increase sensitivity to the perception of dry eye symptoms (49). Increased depression symptoms are present together with clearly subjective dry eye symptoms like blurring, but not with the dry eye objective test results (39). Similar results were found in other studies (35,40,41).

There are also results suggesting that unmedicated, newly-diagnosed depressive patients show no significantly correlated depression and anxiety based on test results with self-reported dry eye symptoms (50), but they have not yet been replicated.

It is not yet clear whether severe DED symptoms are a possible cause of depression through chronic pain and negative impact on daily activities, or if depression and its medication causes DED, or if some other factor is causing symptoms of both disorders (41). The latter is possible because they share some same risk factors (49).

Additional corroboration that depression may have a causal effect on the eye, at least in case of DED, lies in the fact that chronic depression can promote the production of proinflammatory cytokine and thus worsen DED symptoms (49).

SP-a možda uzrokovana sličnom fiziološkom etiologijom ili je nuspojava lijekova korištenih za ove poremećaje (44).

Uz dužan metodološki oprez pri donošenju zaključaka, čini se da istraživanja ukazuju da komorbiditet očnih i vidnih problema sa simptomima depresije funkcionira na najmanje tri načina:

1. depresivni simptomi su reaktivno stanje na teškoće vida, osobito ozbiljnije;
2. depresija kao osobina ili depresivno stanje može utjecati na vidnu percepciju i probleme oka ili barem osobu učiniti osjetljivijom za percepciju očnih simptoma, i
3. oba problema mogu biti uzrokovana nekim trećim čimbenikom ili dijeliti zajedničku etiologiju, vjerojatno povezanu s disbalansom živčanog sustava ili lijekovima.

Anksioznost

Za sada još malobrojni i nesigurni dokazi pokazuju da ozbiljno napredujuća patologija oka poput keratokonusa može biti povezana s anksioznošću. Rezultati psihološkog testiranja pacijenata s keratokonusom pokazali su povećane rezultate psihastenije i osjetljivosti (32). Međutim, keratokonus zahvaća mlađe odrasle osobe i značajno utječe na njihovu kvalitetu života (51,51) što može biti jedan od mogućih uzroka njihovih psiholoških problema s obzirom da to stanje ozbiljno narušava oštrinu vida.

Empirijski dokazi o povezanosti SSO-a i anksioznosti replicirani su i potvrđeni u različitim istraživačkim nacrtima i na različitim uzorcima uključujući i velike (3,8,14,16-19,35,40-45).

Hallak, Tibrewal i Jain ukazivali su da zdravstvena i opća anksioznost i/ili depresija mogu utjecati na razvoj simptoma suhog oka i biti mogući razlozi nesklada između simptoma i znakova SSO-a (41). Szakáts i dr. otkrili su značajno više rezultata u zdravstvenoj anksi-

Galor et al. proposed that the association between DED and depression and PTSD could be caused by similar physiological etiology or as a side-effect of medications for these disorders (44).

With due methodological caution in drawing conclusions, it seems that studies suggest that comorbidity of eye and vision problems with depression symptoms works in at least three ways:

1. Depressive symptoms are a reactive condition to vision difficulties, especially more serious ones.
2. Trait depression or a depressive state can affect visual perception and eye problems or at least make a person more sensitive to the perception of eye symptoms.
3. Both problems may be caused by some third factor or share a common etiology, probably related to neural system disbalance or medication.

Anxiety

There is sporadic and still uncertain evidence that seriously deteriorating eye conditions like keratoconus may be associated with anxiety. The psychological testing results of keratoconus patients showed increased levels of psychasthenia and sensitivity (32). However, keratoconus affects younger adults and significantly affects their quality of life (51,52) which may be one of the possible causes of their psychological problems as the condition worsens their visual acuity.

Empirical evidence of the association of DED and anxiety has been replicated and confirmed in different designs and samples including large ones (3,8,14,16-19,35,40-45).

Hallak, Tibrewal, and Jain suggested that health and general anxiety and/or depression may affect the development of dry eye symptoms and be some of the possible reasons for discordant DED symptoms and signs (41). Szakáts et al. discovered significantly worse scores in health anxiety, depression, and anx-

oznosti, depresiji i anksioznosti u simptomatskoj skupini pacijenata s SSO-om nego u SSO skupini bez simptoma, iako se skupine nisu razlikovale prema rezultatima objektivnih kliničkih testova za SSO (53). Nedavno istraživanje pokazalo je povezanost neurotizma kao osobine ličnosti sa simptomima SSO-a, ali ne i s kliničkim znakovima (8). Navedeni rezultati podržavaju često ustanovljenu neusklađenost između stvarnih znakova i subjektivnih simptoma SSO-a i upućuju da ličnost pacijenta može imati ulogu u percepciji simptoma SSO-a. Može se pretpostaviti da dispozicijske osobine ličnosti moderiraju ili posreduju percepciju očnih simptoma tako da osoba postaje osjetljivija na njih i reaktivno postaje sve zabrinutija očekujući pojavu istih simptoma. Mogući konstrukt ličnosti koji bi se učinkovito uklopio u ovaj model je anksiozna osjetljivost. Reiss i McNally definirali su je kao sklonost strahu od simptoma povezanih s anksioznošću (npr. palpitacije, fiziološko uzbuđenje i sl.) zbog uvjerenja da će se nakon tih simptoma pojaviti neke štetne fizičke, socijalne ili mentalne posljedice (54).

Precizni mehanizmi u podlozi učinaka SSO-a na mentalno zdravlje još nisu poznati, no moguće je da SSO dovodi do neuropatske bolesti koja rezultira kroničnom boli i tako utječe na kvalitetu života što može dovesti do depresije i/ili anksioznosti (13,14).

Uzevši u obzir relevantnost anksioznosti za probleme oka i vida, mogu se oprezno povući neki zaključci, ili radije pretpostavke, kako bi se potakla buduća istraživanja:

1. u usporedbi s depresijom čini se da je anksioznost manje reaktivno stanje na oštećenja vida i probleme oka;
2. anksioznost može, moguće i više od depresije, povećati osjetljivost osobe na probleme oka i vida;
3. neka očna stanja mogu dijeliti etiologiju s anksioznim stanjem ili biti posljedica još neutvrđenog neurofiziološkog stanja.

iety in the symptomatic DED group compared with the asymptomatic group even though both groups were not different according to objective clinical DED tests (53). Recent research showed that neuroticism as a personality trait is associated with the DED symptoms but not with clinical signs (8). All these results support the commonly confirmed discordancy between actual signs and subjective symptoms of DED and suggest that the personality of a patient can play a role in the perception of DED symptoms.

It may be assumed that a constitutional personality trait is moderating or mediating the perception of eye symptoms in such a way that person becomes more sensitive about them and thus reactively becomes more anxious expecting those eye symptoms to occur. Anxiety sensitivity is a possible personality construct that would fit well in this model. Reiss and McNally defined it as a tendency to fear anxiety-related symptoms (e.g. palpitations, physiological arousal, etc.) due to the belief that some harmful physical, social, or mental consequences will occur as a consequence of these symptoms (54).

The precise mechanisms underlying the effects of DED on mental health are yet uncertain, but it is possible that DED results in neuropathic disease, resulting in chronic pain and thus impacting quality-of-life in a way that may result in depression and/or anxiety (13,14).

Considering anxiety in the light of its relevance in eye and vision problems, some conclusions or rather assumptions might be carefully drawn in order to encourage future research:

1. Compared with depression, it seems that anxiety is a less reactive state regarding vision impairment and eye-related problems.
2. Anxiety can, perhaps even more than depression, increase sensitivity to eye and vision problems.
3. Some eye conditions may share common etiology with state anxiety or be a consequence of a yet undetermined neurophysiological state.

Psihološki stres

Razine kortizola, hormonskog korelata psihološkog stresa, više su kod pacijenata s bržom progresijom keratokonusa u usporedbi s pacijentima sa stabilnim keratokonusom i zdravim osobama (55). To znači da stres može na više načina dovesti do keratokonusa i njegovog pogoršanja složenom fiziološkom neravnotežom uzrokovanom velikom koncentracijom kortizola (55). Opet, psihološki stres je najbolje istražen zajedno sa SSO-om (7,14,18,40,43). Međutim, stres se tek usputno i prikladno uključuje u istraživačke nacrte koji su više usredotočeni na depresiju ili anksioznost. Čini se da između tih triju varijabli stres ima najmanji utjecaj na SSO (40). Neki rezultati ukazuju da bi SSO mogao biti učestalo prisutan u stresnim zanimanjima poput bolničara (7) te među ženama (7,43), ali je navedeno još nedostatno za sigurne zaključke. Psihološki stres utječe na aktivnost autonomnog živčanog sustava koji regulira nevoljnu sekreciju suza, stoga je prirodno pretpostaviti da bi stres lako mogao uzrokovati SSO. Budući da pacijenti sa suhim okom koje je otporno na terapiju često imaju anksiozne i depresivne simptome, moguće je da njihovo psihološko stanje utječe na živčani sustav tako da potiskuje suznu žlijezdu od lučenja suza (19). Međutim, autonomna regulacija sekrecije suza nije nimalo jednostavna i očekivana. Pomalo iznenađujuće, suzna žlijezda je anatomski i funkcionalno pretežito inervirana parasimpatičkim živcima (56). Stoga je produkcija suza vjerojatno u funkciji faze oporavka od stresa kako bi se ponovno uspostavila homeostaza očne površine. Tijekom akutnog stresa produkcija i sekrecija suza je inhibirana stoga očna površina isparava, postaje suha i uzrokuje znakove SSO-a. Nakon što neposredni stresor nestane dominantno parasimpatički regulirana aktivnost potiče sekreciju suza kako bi očistile, oporavile, dezinficirale i izliječile očnu površinu. Ipak, autonomni odnos SSA-a sa stresom nije jednostavan i trenutno jasan, jer s druge

Psychological stress

Cortisol, a hormonal correlate of psychological stress, has been found to be higher in patients with higher progression of keratoconus compared with stable keratoconus patients and healthy controls (55). Stress may therefore lead to keratoconus and its progression through a complex physiological disbalance caused by the high concentration of cortisol in more than one way (55).

To reiterate, psychological stress is best investigated together with DED (7,14,18,40,43). However, stress has been included in research designs that focus more on depression or anxiety only sporadically and based on convenience. It seems that among those three variables, stress has the lowest impact on DED (40). Some results suggest that DED might be aggravatedly present in stressful professions like paramedics (7) and amongst women (7,43) but this is still insufficient to reach any certain conclusions.

Psychological stress affects the activity of the autonomic nervous system which regulates involuntary tear secretion, and it is therefore natural to assume that stress could easily cause DED. Because patients with DED resistant to therapy often have anxiety and symptoms of depression, it is possible that their psychological state affects the nervous system to suppress the lacrimal gland from tear secretion (19). However, autonomic regulation of tear secretion is not nearly that simple and predictable. A bit surprisingly, the lacrimal gland is anatomically and functionally predominantly innervated by parasympathetic nerves (56). Thus, tear production is probably a function of the stress recovery phase in order to restore homeostasis of the ocular surface. Tear production and secretion is suppressed during acute stress and consequently ocular surface evaporates, dries off, and causes DED signs. After the immediate stressor disappears, dominantly parasympathetically regulated activity stimulates tear

strane izravni kontakt oka s fizičkim i kemijskim stresorima izaziva trenutno suzenje, te su potrebna daljnja istraživanja.

Nedavno korejsko istraživanje ukazalo je na blisku povezanost psihološkog stresa i SSO-a i predložilo nekoliko plauzibilnih i razumnih objašnjenja (7):

1. pojačani psihološki stres može pojedinca učiniti osjetljivijim i time povećati vjerojatnost da će percipirati okularnu bol kao simptom suhog oka;
2. psihološki stres može povećati sustavnu upalnu aktivnost koja može zahvatiti očnu površinu i izazvati simptome SSO-a;
3. percipirani stres može povećati somatizaciju što može pojačati simptome SSO-a;
4. psihološki stres može rezultirati depresijom za koju je utvrđeno da je rizični čimbenik za SSO;
5. socio-kulturni pritisci mogu dovesti do psihološkog stresa i time do veće prevalencije DED-a u nekim zemljama (uglavnom azijskim).

Svakako ne treba zanemariti način na koji očne bolesti mogu utjecati na socijalne interakcije. Često treptanje, trljanje očiju, upotreba kapi za oči, pretjerano suzenje, svakodnevna nelagoda, česti posjeti oftalmološkim klinikama - sve su to primjeri kako očne bolesti mogu utjecati na ponašanje, socijalne interakcije te smanjiti kvalitetu života i proizvesti određenu količinu psihološkog stresa.

Posttraumatski stresni poremećaj (PTSP)

Još jedan psihijatrijski korelat SSO-a je PTSP i posebno se često pronalazi kod starije i veteranske populacije (6,49,57). Pacijenti s PTSP-om imaju simptome očne površine koji nisu u potpunosti objašnjivi objektivnim kliničkim znakovima i slični su onima kod depresivnih pacijenata (57). Budući da se skupina

secretion to clean, recover, disinfect, and treat the ocular surface. However, the autonomic relation of DED with stress cannot currently be easily understood because, on the other hand, direct eye contact with physical and chemical stressors causes immediate tearing, and thus further studies are needed.

A recent Korean study indicated a close relationship between psychological stress and DED and proposed several plausible and reasonable explanations (7):

1. Increased psychological stress may make an individual more sensitive and likely to perceive ocular pain as a dry eye symptom.
2. Psychological stress can increase systemic inflammatory activity which can affect the ocular surface and result in DED symptoms.
3. Perceived stress can increase somatization which can intensify DED symptoms.
4. Psychological stress can result in depression that has been found to be a risk factor for DED.
5. Possible socio-cultural pressures can lead to psychological stress and thus a larger prevalence of DED in some countries (mostly Asian).

The way that eye diseases may affect social interactions should certainly not be neglected. Frequent blinking, eye-rubbing, eye-drop usage, excessive tearing, daily discomfort, frequent visits to ophthalmic clinics – these are all examples of how eye disease can affect behavior and social interactions as well as decrease the quality of life and produce a certain amount of psychological stress.

Posttraumatic stress disorder (PTSD)

Another psychiatric correlate of DED is PTSD. This is especially common in the elderly and veteran population (6,49,57).

pacijenata s PTSP-om, depresivni pacijenti i kontrolna skupina ne razlikuju u objektivnim znakovima SSO-a, znači da se mogući psihološki čimbenici nalaze u pozadini doživljavanja simptoma. SSO možda dijeli isti patološki mehanizam kao PTSP i depresija, ali može biti i posljedica lijekova koji se koriste za te poremećaje (49). Prema većini istraživanja, čini se da PTSP i depresija imaju sličan učinak na očne simptome, što i nije neobično zbog čestog komorbiditeta koji otežava identifikaciju vjerojatnijeg korelata SSO-a. Kako su istraživanja koja uključuju depresivne sudionike mnogobrojnija, razumno je pretpostaviti da je to ipak depresija. Buduća istraživanja trebala bi uključivati nacrte koji bi omogućili analizu sličnosti i razlika između depresije, stresa i PTSP-a u odnosu na SSO.

Ostali psihički problemi

Od ostalih poteškoća problemi oka i vida (posebno SSO) uglavnom su dovođeni u vezu s vidom povezanom te općom kvalitetom života (12,14) ili sličnim mjerama poput subjektivne sreće (10). Unilateralna oštećenja vida uzrokovana kataraktom imaju mjerljivi učinak na kvalitetu života starijih osoba (1). Zanimljivo je da među različitim oftalmološkim pacijentima najviše pacijenti sa SSO-om imaju problema s kvalitetom spavanja (3). Kvaliteta spavanja povezana je s SSO-om i posebno njegovim simptomima te može biti rizični faktor za SSO (58). S obzirom na činjenicu da je depresija također povezana s poremećajem spavanja (59), potrebno je provesti daljnja istraživanja očito prilično složenog odnosa SSO-a i depresije. Nedavno je čak pronađena i povezanost rizika od suicidalne ideacije s SSO-om (15). Samo nekoliko istraživanja se bavilo bipolarnim poremećajem i SSO-om i rezultati ne otkrivaju mnogo, ali sugeriraju da je SSO kod bipolarnog poremećaja nuspojava lijekova. Pacijenti s bipolarnim poremećajem koji koriste različite stabiliza-

In one study, patients with PTSD experienced ocular surface symptoms that cannot be completely explained by objective clinical signs, and these patients had symptoms with similar expression as depressive patients (57). Since the PTSD and depression groups as well as the control group had no differences in objective DED signs, this may mean that psychological factors underlie the experience of symptoms. DED may share the same pathological mechanism as PTSD and depression but it can also be a consequence of the medication used for these disorders (49).

According to most studies, it seems that PTSD and depression have a similar impact on eye symptoms, which is no surprise due to common comorbidity that makes it harder to identify a more likely correlate of DED. Since the studies involving depression are more numerous, it is reasonable to assume that depression is the one with a correlation to DED. Future studies should include designs that would allow the analysis of similarities and differences between depression, stress, and PTSD in relation to DED.

Other related psychological problems

Among other difficulties, vision and eye problems (particularly DED) have mostly been associated with vision-related and general quality-of-life (12,14) or similar measures like subjective happiness (10). Unilateral visual impairment caused by cataracts has a measurable impact on health-related quality-of-life of elder (1).

Interestingly, among different ophthalmologic patients, patients with DED have the most sleep quality problems (3). Sleep quality is associated with DED and especially its symptoms, and it might be a risk factor for DED (58). Given the fact that depression is also associated with sleep disturbance (59), further investigations of the obviously rather complex relationship between DED and depression should be performed. Recently, even higher risk of suicidal ideation was

tore raspoloženja imaju manje stabilan suzni film od onih koji ne koriste iste lijekove, što znači da su im objektivno bile suše oči (60). Međutim, ovo istraživanje nije uključivalo procjenu subjektivnih simptoma SSO-a za koje se pokazalo da su povezaniji s drugim psihološkim poremećajima. Prema rezultatima psiholoških testiranja pacijenata s SSO-om otpornima na terapiju Nepp je pronašao samo rijetke pojedince s mogućim bipolarnim poremećajem (19).

Očigledno su istraživanja problema oka i vida u kontekstu psihijatrijskih stanja, uz iznimku poremećaja raspoloženja, još su relativno rijetka, ali svakako intrigantna.

Psihijatrijski lijekovi i simptomi povezani s očima

Razumno je pretpostaviti da su lijekovi za psihijatrijska stanja glavni razlog vidnih poteškoća i problema povezanih s očima. Međutim, dokazi u prilog tome su dvosmisleni i nejasni.

Antipsihotici, osobito korišteni s antidepresivima, mogu imati negativne učinke na vidnu funkciju u vizualnom procesiranju kod shizofrenije, a povećavaju i rizik od katarakte (27). Međutim, ove nalaze ne potvrđuju sva istraživanja (61). Unatoč tome preventivni periodički pregledi pacijenata koji su dugo na psihofarmakološkoj terapiji razuman su potez te se preporučuju (62).

Depresivni pacijenti liječeni psihofarmacima, ali i neliječeni, pokazuju značajno smanjenu osjetljivost percepcije subjektivnog kontrasta što znači da je ovo perceptivno odstupanje neovisno o lijekovima (47).

Dugorajno liječenje bipolarnog poremećaja stabilizatorima raspoloženja značajno utječe na stabilnost suznog filma i rezultira suhoćom oka (60). Klinički testovi su dokazali da upotreba antidepresiva može doprijeti znako-

found to be associated with DED (15). Only a few studies dealt with bipolar disorder and DED, and the results were not particularly revealing, but they suggest that DED in bipolar disorder is a side-effect of medication. Medicated bipolar patients using different mood stabilizers have lower stability of tear film than unmedicated patients, meaning that their eyes were objectively dryer (60). However, this study did not include assessment of subjective symptoms of DED which were proved to have more associations with other psychological disturbances. According to psychological test results, Nepp found only rare possible bipolar disorders in patients with therapy-resistant dry eye (19).

Apparently, studies on eye and vision problems in the context of psychiatric conditions other than mood disorders are still relatively rare but intriguing.

Psychiatric medication and eye-related symptoms

A reasonable assumption is that medication for psychiatric conditions is the main reason for visual difficulties and eye-related problems. However, there is ambiguous and unclear evidence in support of this.

Antipsychotics, especially used with antidepressants, can have negative effects on visual function in visual processing in schizophrenia but can also increase the cataract risk (27), although not all studies corroborate these results (61). Nevertheless, preventive periodic eye examinations of patients on long-term medication treatment are recommended and reasonable (62).

Unmedicated and medicated depressive patients showed significantly reduced sensitivity of subjective contrast perception, which means that this perceptual aberration is medication-independent (47).

Long-term mood stabilizer medication for bipolar disorder significantly affects the stability of the tear film and results in eye dryness (60).

vima suhog oka (63,64) i to neovisno o trajanju korištenja antidepresiva (63). Ali ove studije su samo ispitivale kliničke znakove suhog oka i nisu otkrile kako je to povezano s očnim simptomima koje percipiraju pacijenti. Druga studija otkrila je da tek dijagnosticirani i još uvijek neliječeni bolesnici (neki od njih s komorbiditetom anksioznosti) u usporedbi s kontrolnom skupinom imaju teže kliničke znakove SSO-a izmjerene objektivnim testovima, ali nisu različiti prema samoprocijenjenim simptomima suhog oka (50). Međutim, to još uvijek nije sasvim jasno, jer su drugi rezultati potvrdili suprotno (11). Budući da antidepresivi mogu interferirati samo s objektivnim znakovima, a ne i simptomima, može se s oprezom zaključiti da psihološki čimbenik samostalno objašnjava najčešće prijavljene percipirane simptome SSO-a kod depresije. Buduća istraživanja bi trebala potražiti objašnjenje uočenih simptoma suhog oka kod pacijenata s dugom poviješću depresije, mogući utjecaj antidepresiva ili vjerojatnost da se u pozadini simptoma SSO-a nalazi neki drugi psihijatrijski poremećaj ili karakteristika. Kim i sur. su na primjer predložili da SSO simptomi mogu biti simptomi somatizacijskog poremećaja (11).

Preporuke za zbrinjavanje pacijenata

Bez sumnje je da je dobrobit pacijenata najvažnija stručnjacima za zdravlje oka i vida kao i stručnjacima mentalnog zdravlja. Obje skupine u svome radu mogu napredovati od poznavanja komorbiditeta i odnosu između problema oka i vida s psihijatrijskim poremećajima, a to se posebno može odraziti na dobrobit korisnika zdravstvene skrbi. S pozicije zdravstvenog sustava vrijedno je razmotriti moguće smanjenje troškova koje bi točne dijagnoze i adekvatno liječenje pacijenata moglo proizvesti. Mogu se učiniti barem neke praktične i financijski povoljne intervencije:

Clinical tests proved that antidepressant usage can contribute to dry eye signs (63,64) independently of the duration of antidepressant usage (63). But these studies only examined clinical signs of dry eye and did not reveal how this is related to eye symptoms experienced by patients. Another study found that newly-depressed and yet not medicated patients (some of them with comorbid anxiety) had more severe clinical signs of DED compared with the control group measured by objective tests, but there were no differences according to self-reported dry eye symptoms (50). However, these results are not yet fully established because other results showed the opposite (11). Since antidepressants may only interfere with the objective signs and not the symptoms, it can be tentatively concluded that the psychological factors alone mostly explain the perceived subjective symptoms of DED in depression. Future studies would have to explain the perceived dry eye symptoms in patients with a long history of depression, the possible impact of antidepressant medication, and address the probability that some other psychiatric disorder or characteristic underlies the DED symptoms. For example, Kim et al. proposed that DED symptoms might be symptoms of a somatization disorder (11).

Patient management recommendations

Patient well-being is, without a doubt, the primary goal for both eye and vision and mental health experts. In their work, both can benefit from knowledge about comorbidities and relationships between eye problems and psychiatric disorders, and this can be especially beneficial to health-care recipients. From the health system's point of view, it is worth considering a possible reduction of medical expenses that accurate diagnoses and adequate treatment of patients could produce. At least some practical

1. adekvatna obuka stručnjaka za mentalno zdravlje i zdravlje oka o komorbidnim psihijatrijskim i očnim simptomima;
2. uvođenje kratkih trijažnih testova za oči u psihijatrijskoj praksi, odnosno za psihičke simptome u oftalmološkoj praksi;
3. uzajamni konzultativni rad oftalmologa i psihijatara;
4. poboljšanje rehabilitacijskih i tretmantskih pristupa.

Trening stručnjaka za mentalno zdravlje i zdravlje očiju prvi je korak u boljem prepoznavanju koreliranih simptoma u obje prakse. Neki se faktori rizika depresije povezani s oštećenjem vida mogu lako prepoznati u primarnoj zdravstvenoj zaštiti i općim bolnicama te pravilno uputiti stručnjaku i na taj način omogućiti bolji oporavak i prognozu obih stanja ili barem poboljšati kvalitetu života pacijenta (35). Rees i sur. pokazali su da su stručnjaci za očno zdravlje postaju sigurniji i skloniji da reagiraju na depresiju kod pacijenata s oštećenjem vida zahvaljući provedbi jednostavnog i kratkog usavršavanja koje se sastojalo od razumijevanja depresije, detekcije depresivnih simptoma, te razvoja i primjene načina upućivanja pacijenata (2). Osviještenost i znanje o učincima antidepresiva na suho oko može omogućiti oftalmolozima, optometristima i drugim liječnicima da bolje zbrinu pacijente s SSO-om (63).

Trijažni testovi su obično jeftini, laki za primjenu i posebno vrijedni u prevencijskoj medicini. Simptomi suhog oka mogu biti prvi ulaz u medicinsku skrb za pacijente kojima još nije dijagnosticirana depresija ili anksioznost (45). Analogno tome, osviješćenost o mogućoj povezanosti SSO-a i depresije može pomoći stručnjacima očnog zdravlja da učinkovito usmjere potencijalne psihijatrijske bolesnike koji su u zdravstveni sustav ušli prvo u u službe za zdravlje očiju (14). Pacijente s psihijatrijskim dijagnozama potrebno je pitati o simptomima suhog oka i, ako se pokaže nužnim, upu-

and inexpensive interventions could be introduced:

1. Proper training of mental health and eye health professionals about comorbid psychiatric and eye symptoms.
2. Mutual introduction of short screening tests for eye and psychological problems in both practices respectively.
3. Consultations between both practices.
4. Rehabilitation and treatment strategies.

Training of mental health and eye health professionals is the first step in better recognition of the correlating symptoms in both practices. Some depression risk factors associated with vision impairment can be easily recognized in primary health care and general hospitals and properly referred to a specialist, thus enabling better recovery and prognosis of both conditions or at least improving the patient's quality of life (35). Rees et al. demonstrated that simple and short training of eye health professionals consisting of understanding depression, detecting depressive symptoms, and developing and implementing the referral pathway made them more confident and likely to respond to depression in their patients with vision impairment (2). Awareness and knowledge about the effects of antidepressant medication on dry eye disease can enable ophthalmologists, optometrists, and other physicians to better manage patients with DED (63).

Screening tests are usually inexpensive, easy to administer, and especially valuable in preventive medicine. Dry eye symptoms may be the first entrance into medical care for patients with undiagnosed depression or anxiety (45). By analogy, awareness of a possible association between DED and depression may help eye-care professionals to efficiently refer possible psychiatric patients first admitted in eye care services (14). Patients diagnosed with psychiatric conditions should be asked about

titi stručnjaku za zdravlje očiju bez obzira na uzrok (44). Na primjer, na jednostavan način može se primijeniti kratak, ali često korišten, Indeks bolesti očne površine (engl. *Ocular surface disease index*©, OSDI©) (65,66) koji se pokazao solidno pouzdanim i valjanim (67). Također, stručnjaci za očno zdravlje mogu jednostavno do neke mjere primijeniti određene trijažne postupke kako bi identificirali pacijente s rizikom za psihijatrijska stanja i adekvatno ih usmjerili. Na primjer, rizični faktori za depresiju povezanu s oštećenjem vida mogu se lako identificirati sa samo dva jednostavna pitanja (35).

Konzultacije i timski rad dobro su utvrđene prakse u medicini, ali u ovom slučaju mogu se dodatno naglasiti. Vjerojatno bi se većina liječnika upoznatih s problemima o kojima je riječ u ovom radu složila da je tijesna suradnja očnih i psihijatrijskih odjela ili klinika u medicinskim ustanovama ključna. Kako bi se pacijentima očnih klinika s psihijatrijskim simptomima pružila bolja zdravstvena zaštita, preporučuju se izravne konzultacije s psihijatrijskim službama (3) uz naglasak da bi takva praksa trebala biti obostrana.

Iako bi se psihološka stanja tek u budućnosti mogla pokazati uzrokom nekih problema oka, trebalo bi istovremeno primijeniti adekvatnu medicinsku skrb oka zajedno s psihijatrijskim ili psihoterapijskim tretmanom kako bi se pacijentu osigurala najbolja moguća kvaliteta života koja će mu omogućiti da se osjeća bolje i lakše nosi sa svojim mentalnim stanjem.

Zbrinjavanje psiholoških simptomima kod pacijenta s oštećenjem vida može biti izrazito važno i učinkovito u njihovoj rehabilitaciji, jer se vidno oštećenje može percipirati lošijim nego što jest (68). I posljednje, ali ne i najmanje bitno, pacijenti s nepovratnim i ozbiljnim gubitkom vida svakako trebaju svu moguću podršku i skrb o njihovim reaktivnim psihičkim stanjima što ima veliko značenje za njihovu prilagodbu.

dry eye symptoms and, if necessary, referred to eye care professionals whatever the cause may be (44). For example, the widely used Ocular Surface Disease Index© (65,66) is a short questionnaire that can be easily applied and has proven itself to be of decent reliability and validity (67). Furthermore, eye care professionals could easily apply some screening procedures to identify patients with a risk of psychiatric conditions and to refer them to proper care. For example, risk factors for depression associated with vision impairment can be easily identified with only two simple screening questions (35).

Consultation and teamwork are well-established practices in medicine, but they can be additionally emphasized on this issue. It is likely that most of the practitioners familiar with the problems discussed in this paper would agree that close cooperation of eye and psychiatric departments or clinics in medical institutions is crucial. Direct consultations with psychiatry services are recommended in order to provide better health care for the eye clinic patients with psychiatric symptoms (3). However, this practice should be mutual.

Even though psychological conditions could prove to be a cause of some eye problems in the future, proper eye care should be applied together with psychiatric or psychotherapeutic treatment in order to assure the best possible quality-of-life, which in return will make the patients feel better and cope with their mental condition more easily.

Addressing the psychological symptoms in patients with visual impairments can be extremely important and effective in their rehabilitation since visual disability may be perceived as worse than it is (68). Last but not least, patients with irreversible and serious vision loss certainly need all possible support in dealing with their reactive psychological conditions is of significant importance to their adaptation.

ZAKLJUČNA RAZMATRANJA

Problemi s vidom i patologija oka često su u komorbiditetu s psihijatrijskim stanjima ili barem s psihološkim problemima. Na temelju brojnih istraživanja, problemi oka i vida, osobito blaže prirode, najviše su povezani s poremećajima raspoloženja, posebno depresijom, anksioznošću i PTSP-om, a rjeđe s psihološkim stresom i drugim stanjima. Ozbiljnija patologija oka, koja rezultira značajnim gubitkom oštrine vida, povećava rizik za reaktivnu depresiju. Manje istraživanja pokazuje da određeni psihotični poremećaji mijenjaju vidnu percepciju strukturno i fiziološki utječući ne samo na mozak, već i na mrežnicu oka.

Prema predloženim objašnjenjima u literaturi, veza između problema oka i vida s psihijatrijskim problemima funkcionira na nekoliko načina:

1. psihijatrijska stanja mogu biti reaktivna na probleme s očima i vidom;
2. problemi oka i vida mogu uzrokovati psihičke smetnje;
3. moguće je postojanje osobina ličnosti koje mogu moderirati ili posredovati u percepciji problema oka i vida;
4. obje skupine problema mogu dijeliti barem djelomično zajedničke faktore rizika, etiologiju i patofiziologiju;
5. psihijatrijski lijekovi mogu utjecati na stanje oka i vizualnu percepciju.

Razni i brojni nalazi ukazuju da svaki od razmatranih zdravstvenih problema u ovom radu može biti barem djelomično uzročan, ali i posljedičan čimbenik, ili mogu istovremeno koegzistirati ili biti posljedica nekih vanjskih čimbenika, poput medikacije. Ipak, potrebno je provesti mnogo više istraživanja kako bi se te veze preciznije istražile. Neke od smjernica za buduća istraživanja koja najviše obećavaju su identifikacija osobina ili osobine ličnosti koje doprinosi osjetljivosti na probleme s očima i vidom te identifikacija neuropatskog

CONCLUDING CONSIDERATIONS

Vision problems and eye pathology are often comorbid with psychiatric conditions or at least with psychological problems.

Based on numerous studies, eye and vision problems, particularly of milder nature, are mostly associated with mood disorders, especially depression, anxiety, and PTSD, and less with psychological stress and other conditions. More serious eye conditions resulting in a significant loss of visual acuity increase the risk of reactive depression. Fewer studies indicate that some psychotic disorders alter the visual perception structurally and physiologically by affecting not only the brain but the retina as well.

According to proposed explanations in the literature, the relationship between eye and vision problems and psychiatric problems works in several ways:

1. Psychiatric conditions can be a reactive state as a result of eye and vision problems.
2. Eye and vision problems can cause psychological disturbances.
3. There may be personality traits that can moderate or mediate the perception of eye and vision problems.
4. Both groups of problems may at least partially share common risk factors, etiology, and pathophysiology.
5. Psychiatric medication can affect eye conditions and visual perception.

As presented in this paper, various and numerous findings suggest that both eye and vision problems and psychiatric conditions can be at least partially a causal and consequential factor, or can coexist at the same time, or can be the consequence of some other external factors such as medication therapy. However, much more research is needed to investigate these links more closely. Some most promising directions for future research are the identification of a personality trait or traits that contribute

mehanizma koji bi mogao biti zajednička osnova nekim psihičkim i očnim problemima. Najnovije istraživanje ukazuje na alternativnu ideju da osobinski koncept ličnosti anksiozna osjetljivost povećava tendenciju zamjećivanja i doživljavanja simptoma SSO-a, jer objašnjava više varijance nego kumulativna mjera stresa, depresije i anksioznosti (69). Bez obzira na temeljne uzroke koji stoje iza ovog odnosa, problemima oka i vida psihijatrijskih pacijenata treba se baviti, jer ispravan i sveobuhvatan tretman može poboljšati njihovo stanje, a vjerojatno i prognozu bolesti. Vrijedi i obrnuto, prepoznavanje psihičkih simptoma i mogućih psihijatrijskih problema u kontaktu s pacijentima koji se primarno javljaju u očne klinike zbog problema oka ili vida može biti prvi ulaz pacijenta u sustav psihijatrijske skrbi. Također, uporaba suvremene dijagnostičke oftalmološke opreme koja može otkriti neke biološke biljege psihijatrijskih poremećaja može biti od izrazite vrijednosti u dijagnostičkim postupcima.

to sensitivity to eye and vision problems and the identification of a neuropathic mechanism that could be a common basis for some psychological and eye problems. Most recent research suggested an alternative idea: that the anxiety sensitivity trait increases the tendency to detect and experience DED symptoms, as it explains more variance than the cumulative measure of stress, depression, and anxiety (69).

Regardless of the underlying causes behind this relationship, eye and vision problems need to be addressed in psychiatric patients, as correct and comprehensive treatment can improve their condition and probably also their prognosis. Conversely, recognizing the psychological symptoms and possible psychiatric problems in contact with patients who initially present to eye clinics due to vision or eye problems may be the first entry to psychiatric care. Furthermore, the use of modern diagnostic ophthalmologic equipment that can detect some biological markers of psychiatric disorders can be of exceptional value in diagnostic procedures.

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