Short communication

Charles Bonnet syndrome precipitated by brimonidine


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A R T I C L E   I N F O

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A B S T R A C T

Case report: An 81-year-old woman with age-related macular degeneration and pseudoxfoliative glaucoma developed visual hallucinations (faces, flowers and frames) shortly after beginning brimonidine drops. Neurologic and psychiatric examination was normal. Visual hallucinations disappeared within 10 days after discontinuing the drug.

Discussion: The Charles Bonnet syndrome (CBS) is characterized by complex visual hallucinations in elderly patients in the setting of significant visual impairment without any psychiatric symptoms. Awareness of CBS among ophthalmologist is essential. Clinicians should treat visual impairment and be aware of possible visual hallucinations in patients treated with brimonidine.

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Síndrome de Charles Bonnet desencadenado por brimonidina

R E S U M E N

Caso clínico: Mujer de 81 años con degeneración macular y glaucoma pseudoxfoliativo. Poco después de iniciar tratamiento con brimonidina, la paciente presentó alucinaciones visuales (caras, flores y marcos). La exploración neurológica y psiquiátrica era normal. Retiramos la brimonidina y las alucinaciones desaparecieron 10 días después.

Discusión: El síndrome de Charles Bonnet (SCB) consiste en alucinaciones visuales complejas en pacientes ancianos con un deterioro de visión significativo sin alteraciones psiquiátricas. Es importante el conocimiento del SCB por parte de los oftalmólogos. Debemos tratar la enfermedad visual y tener en cuenta el posible desarrollo del SCB en pacientes tratados con brimonidina.

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**Introduction**

The Charles Bonnet syndrome (CBS) is a condition involving complex visual hallucinations in patients with significantly deteriorated vision and preserved cognitive conditions. Possibly, the prevalence of CBS is underdiagnosed because ophthalmologists and emergency physicians are not fully aware of the syndrome as well as by the fear of patients to be regarded as having psychiatric problems. Prevalence has been estimated between 11% and 30% of patients with visual acuity (VA) under 20/200. Patients are usually elderly, between 75 and 84 years, with a small predominance of females. Usually, hallucinations consist in human figures, faces, animals, plants and buildings. These hallucinations are repetitive and subsist between 1 min and 1 h, frequently with color and movement. Possible trigger factors are fatigue, stress, low lighting and glare. Visual hallucinations are not associated to any other type of sensory hallucination, with the absence of delirium being a key factor. The patient is aware that the image is unreal and this is a main factor to differentiate from psychiatric conditions even though it can produce intense secondary anxiety syndrome.

The causes for low VA include age-related macular degeneration (ARMD), glaucoma and cataract. The condition has been reported to appear after the application of photodynamic therapy, intravitreal bevacizumab injection and topical use of brimonidine as well as systemic diseases and brain surgery.

The case of a patient with ARMD and glaucoma is presented, with the CBS precipitated by the use of brimonidine in both eyes.

**Clinic case report**

A female, aged 81 years, visited the practice reporting visions of faces, flowers and picture frames, all of them in movement and repetitive with onset 2 days back. The ophthalmological history included cataract surgery, dry ARMD and pseudo-exfoliative glaucoma which required trabeculectomy in both eyes (BE). The patient was in treatment with brinzolamide (Azopt®, Alcon-Cusi, Barcelona) in the right eye (RE) for one year and brimonidine (Alphagan®, Allergan, Madrid) in BE in the last month.

In the RE, VA was of finger counting at 1 m and 20/400 in the left eye (LE). Biomicroscopy revealed correct pseudophakia in BE. Intraocular pressure was of 16 mmHg in BE. The ocular fundus revealed pale papilla, dry ARMD and inferior temporal retinoschisis in the LE.

Interdisciplin ary consultation was requested from the Neurology and Psychiatry Service which did not produce pathological findings. It was decided to suspend brimonidine and 10 days later the hallucinations disappeared.

**Discussion**

The prevalence of CBS is increasing in our environment together with the increased life expectancy of patients, many with visual impairment secondary to ARMD. The cause of said hallucinations is unknown but the theory of neuronal differentiation is postulated. According to this theory, the deterioration of the information received in the occipital cortex gives rise to biochemical, histological and anatomical changes that produce neuron hyper-excitability which in turn produces hallucinations.

Brimonidine is an α2-agonist liposoluble drug with the ability to cross the blood-brain barrier. After ocular administration, systemic concentration of the drug peaks between 1 and 4 h before diminishing. Its mean elimination period is of 3 h. Adverse effects have been described at the central nervous system in elderly patients (hearing hallucinations, depression, confusion and anxiety) as well as in children (coma, hypotension, bradycardia, hypotony and hypothermia). Brimonidine is similar to clonidine, also an α2-agonist, capable of causing visual and auditory hallucinations. In this case, CBS appeared with the use of topical brimonidine.

The therapeutic management of CBS requires reassuring the patient that it is not a psychiatric disease but the nature of the process. The core visual disease must be treated as visual function improvements have been associated with diminished hallucinations. Some drugs such as olanzapine, donepezil and serotonin capture selective inhibitors are able to control said hallucinations. However, their efficiency is based on isolated clinical cases and not on clinical trials. Generally, an adequate explanation of the benign characteristics of the condition is sufficient to avoid pharmacological intervention. In some cases, visual hallucinations disappear spontaneously within a period of 9–12 months. In addition, it is useful to improve living conditions and promote greater social interaction. In this case, suspending the use of brimonidine was enough to control the condition. Patients must be assessed by Neurology and Psychiatry to discard any disease which could give rise to hallucinations.

By way of conclusion, ophthalmologists should be aware of CBS as well as treating the cause of the visual impairment and taking into account any possible development of CBS in patients treated with brimonidine.

**Conflict of interests**

No conflict of interests has been declared by the authors.

**REFERENCES**

