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- to recurrent oral ulceration. *Proc Roy Soc Med* 1968; **61**: 515-24.
- 23 Sandor M, Houlden B, Bluestone J, Hedrick SM, Weinstock J, Lynch RG. In vitro and in vivo activation of murine  $\gamma/\delta$  T cells induces the expression of IgA, IgM and IgG Fc receptors. *J Immunol* 1992; **148**: 2363-69.
- 24 Stanford MR, Kasp E, Whiston E, et al. Heat shock protein peptides reactive in patients with Behcet's disease are uveitogenic in Lewis rats. *Clin Exp Immunol* 1994; **97**: 226-31.
- 25 Porcelli S, Brenner MB, Greenstein JL, Balk SP, Terhorst C, Bleicher PA. Recognition of cluster of differentiation 1 antigens by human CD4 CD8 cytotoxic T lymphocytes. *Nature* 1989; **341**: 447-50.
- 26 Haas W, Periera P, Tonegawa S. Gamma/delta cells. *Ann Rev Immunol* 1993; **11**: 637-86.
- 27 Ferrick DA, Schrenzel MD, Mulvania T, Hsieh B, Ferlin WG, Lepper H. Differential production of interferon- $\gamma$  and interleukin-4 in response to Th1- and Th2-stimulating pathogens by  $\gamma/\delta$  T cells in vivo. *Nature* 1995; **373**: 255-57.
- 28 Kaufmann SHE, Blum C, Yamamoto S. Crosstalk between  $\alpha/\beta$  T-cells and  $\gamma/\delta$  T-cells in vivo: Activation of  $\alpha/\beta$  T-cell responses after  $\gamma/\delta$  T-cell modulation with the monoclonal antibody GL3. *Proc Natl Acad Sci USA* 1993; **90**: 9620-24.
- 29 Munk E, Gatrill AJ, Kaufmann SHE. Target cell lysis and IL-2 secretion by  $\gamma/\delta$  T lymphocytes after activation with bacteria. *J Immunol* 1990; **145**: 2434-39.
- 30 Boismenu R, Havran R. Modulation of epithelial cell growth by intraepithelial  $\gamma/\delta$  T cells. *Science* 1994; **266**: 1253-55.

## Visual hallucinations in psychologically normal people: Charles Bonnet's syndrome

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### Summary

**Background** Charles Bonnet's Syndrome (CBS), characterised by the presence of complex visual hallucinations in psychologically normal people, was considered for a long time to be rare. Systematic research on CBS has been limited. However, it has been realised that CBS occurs frequently in elderly, visually handicapped patients, and we have been able to study the syndrome in a large number of patients.

**Methods** After screening 505 visually handicapped patients, 60 were found to meet proposed diagnostic criteria for CBS (generally, the existence of hallucinations without delusions or loss of insightful cognition.) Psychopathological characteristics, personal meaning, and the emotional impact of hallucinations, as well as factors influencing the hallucinations, were analysed.

**Findings** Although diagnostic criteria demand merely "partial insight", all patients had full insight into the unreal nature of their hallucinations. Other characteristics varied. In 46 (77%) patients, hallucinations lacked a personal meaning. Sensory deprivation and a low level of arousal seemed to favour the occurrence of hallucinations. CBS caused considerable distress in only 17 (28%) patients. However, all patients were glad to be told that their hallucinations were not due to mental disease. The proper diagnosis had been made in only one of the 16 patients who had consulted a doctor.

**Interpretation** Although largely unrecognised in clinical practice, CBS should be considered as a diagnosis in patients who complain of hallucinations and who meet defined diagnostic criteria. There is no proven treatment, but many patients will benefit from reassurance that their hallucinations do not imply mental illness.

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### Introduction

Charles Bonnet's syndrome (CBS), named after the Swiss philosopher who described the phenomenon for the first time in 1760, is characterised by the presence of complex visual hallucinations in psychologically normal people.<sup>1,2</sup> For a long time the syndrome was considered to be rare. In 1989 Podoll and co-workers counted only 46 patients who had been described in the literature since 1760.<sup>3</sup> Probably because of the presumed rarity of the condition—and the lack of generally accepted diagnostic criteria—systematic research on CBS has been limited. The present state of knowledge, based upon single case reports and some small case series, may be summarised as follows. CBS patients have complex visual hallucinations which cannot be explained by the presence of a psychiatric disorder. They have insight into the unreal nature of their perceptions. The course of the syndrome may be episodic, periodic, or chronic. Response to neuroleptic medication is poor. The majority of patients are old and already have disorders of the eyes or central visual system. Many questions concerning the clinical characteristics of the syndrome, its aetiology and pathogenesis remain unanswered.<sup>2,7</sup>

Several authors have questioned the rarity of CBS. They suggested that many patients did not report their hallucinations out of fear of being considered insane.<sup>8,11</sup> Diagnostic criteria for CBS have been proposed.<sup>5,11</sup> Associations of CBS with advanced age and low visual acuity were made and a prevalence of 11% in a group of 300 visually handicapped patients was found.<sup>12</sup>

In this article, results of a further study on 60 patients with CBS are given. Our aims were to explore the psychopathological characteristics of the hallucinations, their personal meanings and influencing factors, and to assess the extent of distress associated with the syndrome.

"In my dreams I experience things which affect me; which are related to my life. These hallucinations, however, have nothing to do with me."

The GP . . . responded: "You'd better not talk about such silly things".

"Why have you not told me about this?", the amazed wife of one man asked . . . "I didn't want to upset you", he replied.

## Patients and methods

A case-finding study was undertaken at the Low Vision Unit of the Department of Ophthalmology, University Hospital, Nijmegen, to which visually handicapped patients are referred to receive reading aids from an optometrist. Of 511 consecutive patients older than 18 years, 505 gave their informed consent to participate in the study.

Data were collected on demographic characteristics, ophthalmic diagnoses, and visual acuity. All patients underwent a semistructured interview on complex visual hallucinations with one of four trained interviewers. In cases of possible or probable complex visual hallucinations, the patient's informed consent to a further investigation was asked. This investigation comprised an interview by a psychiatrist (RJT) at the patient's home. The psychiatrist checked whether the definition of hallucinations in the *Diagnostic and statistical manual of mental disorders* was met: "A sensory perception without external stimulation of the relevant sensory organ."<sup>11</sup> A general psychiatric examination was done with the Dutch language version of the Geriatric Mental State Schedule.<sup>14,15</sup> The psychiatrist then decided whether the following criteria for the CBS were met:

- at least one complex visual hallucination within the past 4 weeks;
- a period between the first and the last hallucination exceeding 4 weeks;
- full or partial retention of insight into the unreal nature of the hallucinations;
- absence of hallucinations in other sensory modalities;
- absence of delusions.

Using a checklist, we interviewed the patients with special attention to psychopathological characteristics, personal meaning of the hallucinations, factors encouraging or stopping the hallucinations, and the emotional impact of the hallucinations on the patient.

## Results

63 of the 505 visually handicapped patients had experienced complex visual hallucinations in the 4-week period before screening; one patient did not meet CBS criteria because of lack of insight and coexistence of acoustic hallucinations; two patients refused further examinations.

18 men and 42 women with CBS remained. Their ages ranged from 46 to 98 years with a mean age of 75.4 (SD 8.0 years). Mean visual acuity in the best eye was 0.23 (SD 0.18). The most frequent causes of visual impairment were age-related macular degeneration (31 patients), diabetic retinopathy (11 patients), glaucoma (four patients), and corneal disease (three patients). 11 patients had less common ophthalmic diagnoses. Psychiatric examination of the patients revealed no disorders which could be considered to be the cause of their hallucinations.

The mean age at onset of CBS was 72 years (SD 5). The duration of the syndrome at the time of screening ranged from 1 month to 30 years: 29 patients had experienced hallucinations for less than 1 year, 21 between 1 to 5 years and ten for more than 5 years.

### Psychopathological characteristics

The frequency of hallucinatory episodes varied from several times daily to only twice a year. In the course of time, frequency had decreased in ten patients, had increased in two, and had remained unchanged in 48. Hallucinatory episodes had lasted from a few seconds to many hours. The patients described the content of their hallucinations as people, animals, plants, a large variety of inanimate objects, and sometimes complete scenes. Often, the content of hallucinations was mundane (an

Characteristic	%	Characteristic	%
<b>Frequency*</b>		<b>Duration</b>	
Daily	27	1-5 s	13
Weekly	30	5-60 s	17
Monthly	35	1-60 min	53
Less often	8	>1 h	15
		Not certain	2
<b>Content†</b>		<b>Familiarity of content</b>	
People	80	Always	8
Adults	70	Sometimes	25
Faces	35	Never	65
Children	23	Not certain	2
Large groups	12		
Miniature of people	3	<b>Influence of eyelids</b>	
Animals	38	Only with opened eyes	67
Plants/trees	25	Only with closed eyes	13
Buildings	15	Variable	20
Scenes	15		
Other objects	42	<b>Moving with eyes</b>	
<b>Relationship to surroundings‡</b>		Always	18
Fitting in well	22	Sometimes	15
Randomly projected	37	Never	52
Variable	28	Not certain	13
<b>Presence of colours</b>		<b>Clarity</b>	
Always	63	As real objects	27
Sometimes	10	Clearer	45
Only black/white	27	Less clear	20
		Variable	8
<b>Intrinsic movement</b>		<b>Movement "en bloc"</b>	
Always	30	Always	22
Sometimes	17	Sometimes	3
Never	53	Never	72
		Not certain	3
<b>Recurring objects</b>		<b>Stereotyped hallucinations</b>	
Always	22	Always	10
Sometimes	18	Sometimes	5
Never	60	Never	85

\*Mean frequency over last 3 months. In 19 patients the frequency was variable: days/weeks with many hallucinations were followed by weeks with no or few hallucinations. †More than one item may be mentioned. ‡Only applicable to patients hallucinating with opened eyes.

Table 1: Characteristics of hallucinations in 60 patients with Charles Bonnet syndrome

unfamiliar person, a bottle, a hat), but it could be funny (two miniature policemen guiding a midget villain to a tiny prison van), ghostly (translucent figures floating in the hallway), bizarre (a dragon, people wearing one big flower on their heads), as well as beautiful (a shining angel, wonderful bunches of flowers). Most patients described a large variety of hallucinations, differing in each hallucinatory episode. Sometimes the sensation of specific objects returned, but stereotyped hallucinations (identical in every respect) were uncommon. Hallucinations contained both familiar and unfamiliar images. The hallucinations occurred both in black and white or colour. They could be clearer, equally clear, or less clear in comparison to reality. They could show intrinsic movement, a movement of the total image, or be motionless. Sometimes the hallucinations moved along with the eyes. Most patients hallucinated only with their eyes open. Some perceived hallucinated objects as floating in the air or projected on a wall or ceiling. Others reported that the objects fitted well into the surroundings (eg, an unreal person sitting in a real chair). Patients hallucinating while their eyes were closed perceived hallucinations in the dark subjective space in front of the eyes. The numbers of patients who reported these characteristics are listed in table 1.

49 patients (82%) stated they were always immediately aware of the unreal nature of their hallucinations. 11 (18%) had sometimes been deceived for a short period, but this had happened only when hallucinated objects

Favourable circumstances studied in all patients	%	Acts stopping hallucinations studied in all patients	%
<b>Specific times of day</b>		<b>Influence of eyelids*</b>	
Evening	35	Keeping eyes closed	38
Night	23	Keeping eyes opened	15
Middle of day	12		
Early morning	10	<b>Approaching hallucinated object*</b>	20
<b>Light intensity</b>			
Poor lighting	65		
Bright daylight	15		
<b>Being inactive</b>	85		
<b>Home environment</b>	72		
<b>Being alone</b>	38		
<b>Other favourable circumstances</b>		<b>Other acts stopping hallucinations†</b>	
Fatigue	10	Looking/walking away	15
Nervousness/stress	8	Putting on a light	10
Watching television	5	Blinking	8
Sitting in a car	5	Moving eyes swiftly	5
Laser therapy eyes	2	Fixed hallucination with eyes	5
Using temazepam	2	Concentrating on something else	5
		Hitting hallucination	2
		Shouting	2

\*The effect of these acts had not been tried out by all patients. †Answers to the question "have you noticed other favourable circumstances and/or methods to stop hallucinations?".

Table 2: Circumstances favouring and acts stopping hallucinations in 60 patients with Charles Bonnet syndrome

looked ordinary and fitted realistically in the surroundings. The patients were always easily corrected by others while hallucinating. A woman told us she once sat at her window watching cows in a neighbouring meadow. It was actually very cold and in the middle of winter, and she complained to her maid about the cruelty of the farmer. The astonished maid, however, saw no cows. Embarrassed, the patient then admitted that her eyes were no longer to be trusted.

#### Personal meaning of the hallucinations

46 (77%) patients could not detect any personal relevance of the hallucinations. Even if hallucinated objects were familiar to them, they were emotionally of no apparent importance. One woman compared her hallucinations with her dreams: "In my dreams I experience things which affect me, which are related to my life. These hallucinations, however, have nothing to do with me."

Three (5%) patients were uncertain whether or not some of their hallucinations had a personal meaning: an elderly, childless gentleman was intrigued by recurrent hallucinations of a little girl and boy. He wondered whether these hallucinations reflected his unfulfilled wish to become a father.

Ten (17%) patients experienced hallucinations involving emotionally important as well as unimportant objects. For instance, one patient perceived a great number of people, most of whom were unfamiliar, but occasionally a deceased relative appeared among them.

Only one (2%) patient had hallucinations with an exclusively personal, emotionally relevant content: these always involved her late husband. Since his death, 3 years earlier, she experienced these hallucinations several times weekly.

#### Factors influencing hallucinations

No patient was able to consciously evoke hallucinations or exert influence on their content. Many, however, had noted circumstances which seemed to favour the

occurrence of hallucinations and/or had found methods to stop hallucinating. Details are shown in table 2.

#### Emotional impact of the hallucinations

The emotional response to the hallucinations was mainly negative in 19 (32%) patients: anxiety in 14 and irritation in five. 11 (18%) patients showed mixed emotions and in 22 (37%) the emotional response was neutral. Eight (13%) had felt joy or amusement during their experiences. General feelings of well-being were not disturbed by the hallucinations in 43 (72%) patients. 17 (28%) suffered from their hallucinations and hoped that they would disappear; only six felt enough distress to consider taking medication to suppress their hallucinations.

44 (73%) patients had not mentioned their extraordinary experiences to doctors: 15 feared their doctor would not take them seriously or would think they were insane; 20 thought this was not the kind of complaint for which one consults a doctor; nine gave no explanation. Only one of the 16 who had consulted a doctor (mostly a general practitioner or ophthalmologist) was informed about the proper diagnosis. Seven had experienced the doctor's reaction as negative. A patient who consulted a psychiatrist because of family problems and then mentioned her hallucinations promptly received neuroleptic treatment. This treatment had not suppressed hallucinations but had only made her feel awkward. The general practitioner of another patient had responded with: "you'd better not talk about such silly things!"

#### Discussion

The clinical characteristics of CBS show rich variety. We found no characteristics which were common to all patients in addition to the inclusion criteria we used. However, in this population, the criterion "full or partial insight" could be sharpened to "full insight". Some patients had occasionally needed correction by others, but this was because the ordinary appearance of their hallucinations, fitting well in the surroundings, made it very difficult or even impossible to discriminate real from unreal.

There is a continuing discussion in the literature as to whether CBS-type hallucinations are newly created products of fantasy or reproductions of earlier true perceptions.<sup>3,4,6</sup> The fact, that the majority of our patient's hallucinations contained objects that they did not remember having seen in reality seems to support the first theory. However, sometimes familiar objects were recognised, though one could argue that these familiar objects are also new creations, which are modelled after earlier true perceptions. In favour of the second theory it could be suggested that the patients had once seen the unfamiliar objects in reality, but had forgotten them because they were of no particular interest. We cannot bring this discussion to a conclusion.

Some authors have suggested that the content of the hallucinations in CBS is influenced by wishes or preoccupations of the patients.<sup>4,7</sup> This theory seemed probable in only a minority of the patients in our study. The infrequent occurrence of emotionally important objects in the large variety of hallucinations may just be coincidental.

The circumstances favouring hallucinations provide some support for the suggestion that sensory deprivation and a low level of arousal are triggers for CBS type-hallucinations.<sup>3,4,6,10,16</sup> Circumstances such as "early

morning", "evening" and "night", "being inactive", "home environment", "fatigue", and "using temazepam" might be associated with a low level of arousal. "Poor lighting", "being alone", and "laser therapy for the eyes" may point to sensory deprivation. Possibly typical acts that stop hallucinations reflect an increase in the level of arousal and/or sensory stimulation.

CBS had little impact on the general feelings of well-being in the majority of patients. Nevertheless, all of them were glad to be informed that it was a known phenomenon, which had a name and was not considered to be a mental disorder. This study shows that many patients do not consult a doctor about CBS. We also found that patients tended to conceal their extraordinary experiences from others: "Why have you not told me about this?", the amazed wife of one man asked as he confessed to the interviewer that he had perceived faces for 3 years. "I didn't want to upset you", he replied.

The experiences of those patients who sought professional advice also indicate that many doctors are not familiar with CBS. Patients would benefit if doctors recognised CBS and gave them proper information, including reassurance that they are not mentally ill. For most patients this response will be sufficient. Support should be offered to those who cannot cope with their hallucinations. No treatment of proven effectiveness is yet available.

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#### References

- 1 Bonnet C. Essai analytique sur les facultés d l'âme. Copenhagen: Philibert, 1760.
- 2 De Morsier G. Le syndrome de Charles Bonnet: hallucinations visuelles des vieillards sans déficience mentale. *Ann Med Psychol* 1967; 125: 677-702.
- 3 Podoll K, Osterheider M, Noth J. Das Charles Bonnet Syndrom. *Fortschr Neurol Psychiatr* 1989; 57: 43-60.
- 4 Damas-Mora J, Skelton-Robinson M, Jenner FA. The Charles Bonnet syndrome in perspective. *Psychol Med* 1982; 12: 251-61.
- 5 Gold K, Rabins PV. Isolated visual hallucinations and the Charles Bonnet syndrome: a review of the literature and presentation of six cases. *Compr Psychiatry* 1989; 30: 90-98.
- 6 Schultz G, Melzack R. The Charles Bonnet syndrome: 'phantom visual images'. *Perception* 1991; 20: 809-25.
- 7 Fuchs Th, Lauter H. Charles Bonnet syndrome and musical hallucinations in the elderly. In: Katona C, Levy R, eds. *Delusions and hallucinations in old age*. London: Gaskell, 1992: 187-98.
- 8 White NJ. Complex visual hallucinations in partial blindness due to eye disease. *Br J Psychiatry* 1980; 136: 284-86.
- 9 Olbrich HM, Engelmeier MP, Pauleikhoff D, Waubke T. Visual hallucinations in ophthalmology. *Graefes Arch Clin Exp Ophthalmol* 1987; 225: 217-20.
- 10 Siatkowski RM, Zimmer B, Rosenberg PR. The Charles Bonnet syndrome. Visual perceptive dysfunction in sensory deprivation. *J Clin Neuro Ophthalmol* 1990; 10: 215-18.
- 11 Teunisse RJ, Raes BCM, Zitman FG. Clinical evaluation of 14 patients with the Charles Bonnet syndrome (isolated visual hallucinations). *Compr Psychiatry* 1994; 35: 70-75.
- 12 Teunisse RJ, Cruysberg JRM, Verbeek A, Zitman FG. The Charles Bonnet syndrome: a large prospective study in The Netherlands. A study of the prevalence of the Charles Bonnet syndrome and associated factors in 500 patients attending the University Department of Ophthalmology at Nijmegen. *Br J Psychiatry* 1995; 166: 254-57.
- 13 American Psychiatric Association. *Diagnostic and statistical manual of mental disorders* (3rd edn, revised). Washington, DC: American Psychiatric Association, 1987: 398.
- 14 Copeland JRM, Kelleher MJ, Kellett JM, et al. A semi-structured clinical interview for the assessment of diagnosis and mental state in the elderly: the geriatric mental state schedule. *Psychol Med* 1976; 6: 439-49.
- 15 Hooijer C, Jonker C, Dewey ME, Van Tilburg W, Copeland JRM. A standardized interview for the elderly (GMS): reliability studies comparing the Dutch language version with the original. *Int J Ger Psychiatry* 1991; 6: 71-79.
- 16 Cole MG. Charles Bonnet hallucinations: a case series. *Can J Psychiatry* 1992; 37: 267-70.