

COGNITIVE IMPAIRMENT AND GENERAL ANAESTHESIA Case report

Paola Presečki¹, Mate Mihanović¹ & Ninoslav Mimica^{2,3}

¹Psychiatric Hospital Sveti Ivan, Jankomir 11, HR-10090 Zagreb, Croatia

²Psychiatric Hospital Vrapče, Bolnička cesta 32, HR-10090 Zagreb, Croatia

³School of Medicine, University of Zagreb, Šalata 3b, HR-10000 Zagreb, Croatia

SUMMARY

Degeneration of cholinergic receptors causes memory disorders and irreversible impairment in cognitive functions, whose advancement can lead to clinically recognizable Alzheimer's disease (AD). Very often, the first symptoms of AD are mood swings and hence depression should be excluded by differential diagnosis since it can also cause memory disorders and cognitive deficits. Due to the characteristic clinical picture of AD, its diagnosis should not be a problem, except at the very beginning of the disease. Many AD patients are never diagnosed and therefore are not adequately treated in clinical practice. Agents used for general anaesthesia reduce cholinergic transmission, which is manifested by loss of consciousness, pain, voluntary movements and memory. In patients with compromised memory and cognitive functionality, general anaesthesia can postoperatively have an adverse effect on the prognosis of degenerative cerebral disease.

A patient is described whose preoperative impaired memory and cognitive functioning deteriorated after general anaesthesia and whose clinical picture reached the extent of AD.

Key words: cognitive impairment - Alzheimer's disease – aetiology – cholinergic receptors – general anaesthetics – diagnosis

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INTRODUCTION

Degeneration of cholinergic receptors causes memory disorders and irreversible impairment in cognitive functions, whose advancement can lead to clinically recognizable Alzheimer's disease (AD) (Bartus et al. 1982). Agents used for general anaesthesia bind to muscarinic and nicotinic acetylcholine receptors and thereby reduce cholinergic transmission, which is manifested by loss of consciousness, pain, voluntary movements and memory (Fodale et al. 2006). In patients with compromised memory and cognitive functionality, general anaesthesia can postoperatively have an adverse effect on the prognosis of degenerative cerebral disease (Xie & Tanzi 2006).

A patient is described whose preoperative impaired memory and cognitive functioning deteriorated after general anaesthesia and whose clinical picture reached the extent of AD.

CASE REPORT

A sixty-year-old patient visited a psychiatrist 17 years ago after stressful situations he experienced during the Homeland War. His basic mood was unstable, he was anxious, suffered from over sweating, had problems with falling and staying asleep, and nightmares. He did not appear for his check-ups regularly and usually visited the hospital only when he got worse. He did not comply with the prescribed therapy. He complained about misunderstanding and unfairness at work, and his depressive symptoms intensified. The patient gave up psychiatric treatment and resumed it after 13 years due to loss of energy and

joy of life, loss of appetite, insomnia, difficulties in controlling aggressive behaviour, inability to concentrate and forgetfulness. He was diagnosed with depressive disorder and psychoorganic syndrome. The patient took antidepressants for five months of psychiatric treatment but complained about their inefficiency. He was offered hospital treatment two times but refused it. He discontinued psychiatric treatment again and resumed it in two years after an operation under general anaesthesia when he was referred to the psychiatrist because of deteriorated mental status involving confusion, forgetfulness and disorientation. His condition was defined as psychoorganic syndrome and metabolic encephalopathy because parenteral administration of high doses of vitamin B₁ resulted in improved brain MR images, regression of metabolic encephalopathy, and absence of focal lesions. The patient had sensory aphasia with dyslexia and dysgraphia, and poor orientation in space and time. The patient was not aware of his condition. After two months, the patient was again submitted to psychiatric treatment. Mnestic deficits were obvious in all memory functions and disorientation in all directions; his speech was incoherent and he confabulated. Psychological testing indicated significant reduction in cognitive function. He needed help with personal hygiene and dressing. Diagnosis of chronic psychoorganic syndrome was made.

DISCUSSION

Mood swings are often the first symptoms of AD and are manifested by apathy, sadness or dysphoria, which can be resistant to antidepressants but could

respond to cholinesterase inhibitors (Mimica & Presečki 2010a, Presečki et al. 2007). Cognitive impairment can be interpreted as part of a depressive episode and mask AD development (Mimica & Presečki 2010a, Presečki et al. 2007). As cognitive impairment progresses, the patient becomes less independent and capable in everyday life; at this stage Alzheimer's dementia can be diagnosed as clinical AD manifestation (Mimica & Presečki 2010b). The course of untreated AD usually starts with mild memory disorders pointing to the beginning of cholinergic degeneration of neurons in nucleus basalis of Meynert. After a period of unspecific symptoms, usually lasting three years, the person gradually loses the capability of independent functioning, which could concur with further degradation of cholinergic neurons in the area surrounding nucleus basalis of Meynert – amygdala, hippocampus and entorhinal cortex. Neurodegenerative process gradually progresses diffusely toward the neocortex and the afflicted person cannot take care of himself/herself any more and requires assistance of others (Stahl 2008). Delirium after general anaesthesia is relatively frequent (Pecotić & Perkov 2007). In patients with undefined memory and cognitive function impairment and those diagnosed with AD whose cholinergic transmission is compromised, general anaesthesia can have an adverse effect on the postoperative course of degenerative mental disease (Fodale et al. 2006).

CONCLUSION

In diagnosing Alzheimer's dementia which, besides gradually progressing memory and cognitive function impairment, can be manifested by mood swings that affect the patient's behaviour, depressive disorder should be excluded by differential diagnosis. AD is rare and sporadic under the age of 55 years. As AD has a characteristic clinical picture, its diagnosis should not be a problem, except at the very beginning of the disease. Many AD patients are never diagnosed and therefore are not adequately treated in clinical practice. Patients with

indications of degenerative mental disease or with already diagnosed AD are exposed to the risk of their condition deteriorating after general anaesthesia. Clinical picture of the described patient enabled AD diagnosis to be made although changes pathognomonic of it were not shown by neuroimaging. A question could be raised whether not to diagnose AD, which is justifiable in some cases for reasons such as diagnostic doubt or fear that this would cause to the patient or his family, with potentially undesirable consequences.

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Correspondence:

Paola Presečki, MD
Psychiatric Hospital „Sveti Ivan“
Jankomir 11, HR- 10090 Zagreb, Croatia
E-mail: pbsvi@pbsvi.hr