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Controversies in geriatric medicine

Sundown syndrome and dementia

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ABSTRACT

The terms "sundown syndrome" or "sundowning" are used to describe a wide range of neuropsychiatric symptoms often occurring in individuals with dementia. It is a poorly defined entity. The goal of this review is to describe the phenomenon of this syndrome, its clinical characteristics and management. Medline and Google Scholar searches were conducted for relevant articles, chapters, and books published before 2014. Search terms used included behavioural and psychological symptoms of dementia (BPSD), circadian rhythms, dementia, sundowning, sundown syndrome. Publications found through this indexed search were reviewed for further relevant references. Sundowning is a complex behavioural disorder with tremendous costs for families, caretakers, and patients themselves. Increased understanding of the sundowning syndrome may lead to more effective environmental, behavioural, or pharmacological interventions.

1. Introduction

The behavioural and neuropsychiatric symptoms of dementia and Alzheimer's disease (AD) have become an increasingly important focus of clinical research. They include aggressiveness [1], repetitive behaviour [2], delusions [3,4] (some bizarre and uncommon) [5,6], misidentifications [7], wandering [8], apathy [9], suicidal [10] and sociopathic behaviour [11]. Both normal aging and dementia are associated with altered circadian regulation of physiology and behaviour. The clinical phenomenon of exacerbation of behavioural symptoms that occurs in the late afternoon or evening among dementia patients or elderly institutionalised patients has been reported in the clinical literature more than 70 years ago [12]. These behaviours include increased disorientation, confusion, agitation, restlessness, wandering and anxiety.

2. Nosology and clinical characteristics

The terms "sundown syndrome", "sundowning" or "nocturnal delirium" are used to describe a wide range of neuropsychiatric symptoms occurring in individuals with dementia. It is a poorly defined entity. It is not a disease, but a set of symptoms that occur at a specific time of the day that may affect people with dementia. Sundowning shares similarities with delirium, e.g. attention deficits and activity disturbances [13]. However, contrary to delirium, sundowning seems to persist for a longer period of time, and it is not associated with acute medical illness, nor with increased mortality as in delirium [14]. Some of the described symptoms of "sundowning" include increased disorientation, confusion, agitation, restlessness, wandering and anxiety, aggression, pacing, screaming, yelling, and hallucinations. Increased activity late in the day corresponds with clinical studies revealing that restlessness is a common behaviour in sundowning [14,15]. The prevalence of sundown syndrome in individuals with dementia is estimated to be 2.4% to 66% [16,17]. This wide variation is primarily due to the numerous definitions of the syndrome (see Table 1). Several authors defined sundowning in different ways: for some it is a sort of "delirium and agitation in hours of darkness" [12], while for others "the appearance or exacerbation of behavioural disturbances associated with the afternoon and/or evening hours" [18]. Cameron [12], who first reported the syndrome in 1941, wrote "The delirium usually appears after retiring to sleep and clears up soon after getting up the next day. During the delirium, there is a complete disorientation; frequently some degree of agitation and panic is apparent; and in the more severe forms, destructiveness and incontinence appear". The American Sleep Disorders Association considers sundowning to include "the sleep disturbance that is characterized by nocturnal wandering and confusion" [19]. The manual goes on to say: "Patients may become confused or disoriented and may present management problems. Typical patterns include wandering outside of the house, turning on kitchen appliances, accidentally breaking household items, and shouting inappropriately. These behaviours may also occur during the daylight hours".

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Table 1
Features of sundown.

Reference	Definition of sundowning	Time of the day when sundowning may happen	Sundowning similarity with delirium	Sundowning dissimilarity with delirium	Disturbance of the 24-hour circadian rhythm	Primary sleep disorder or association with sleep disorder	Zeitgebers contribution to the syndrome	Prevalence of sundowning in patients living at home	Prevalence of sundowning in institutionalised patients	Occurrence of dementia in sundowners	Sample size of the study
Evans, 1987, [15]	It is a significant changes in cognitive status that includes a specific temporal pattern of agitation that occurs in late afternoon; also non demented patients can experience the syndrome	Late afternoon	Yes (sundown is associated to medical illness)	Not reported	Yes	Association with sleep disturbances	Yes	Not reported	12%	82%	$n = 89$ (59 demented patients)
Cohen-Mansfield et al., 1992, [21]	It is a temporal pattern of agitation that occurs in late afternoon in institutionalised patients; it leads to significant caregiver burden	Evening	Not reported	Not reported	Not reported	Not reported	Yes	Not reported	100% (virtually)	Not reported	$n = 24$ (demented patients)
Gallagher-Thompson et al., 1992, [25]	It is night time sleep disturbances accompanied by wandering; it leads to significant caregiver burden	Evening/ night time	Not reported	Not reported	Yes	Primary sleep disorder	Not reported	66%	Not reported	Not reported	$n = 35$ (demented patients)
Rindlisbacher & Hopkins, 1992, [23]	It is an elusive and poorly study phenomenon; it can be described as increased body movements in the afternoon and the evening; the subjects identified by nursing staff as "sundowner" does not differ from those identified as "non-sundowners''; it leads to significant caregiver burden	Late afternoon/ early evening	Not reported	Not reported	Yes	Not reported	Not reported	Not reported	100% (virtually)	Not reported	$n = 12$ (demented patients)
Rindlisbacher & Hopkins, 1992, [23]	It is a poor understood phenomenon in geriatric psychiatry; it can be better defined as an agitated behaviour; it appears to be more common during the day shift	Night time	Yes (nocturnal exacerbation of confusion and disorientation)	Not reported	Yes	Association with sleep disturbances	Yes	Not reported	100% (virtually)	Not reported	$n = 9$ (demented patients)
Little et al., 1995, [14]	The recurring onset of confusion or agitation in elderly patients in the late afternoon; gender may account for difference of prevalence (M > F); severity of dementia is correlated with the syndrome; it leads to significant caregiver burden and premature institutionalisation of the patients	Late afternoon/ early evening	Yes (episodic behavioural disturbance that can fluctuate in intensity, and may be associated with motoric, attentional and cognitive aberrations)	Yes (it is not associated with acute medical illness or with the high motility as in delirium)	Yes	Primary sleep disorder	Yes	Not reported	24%	Not reported	$n = 71$ (demented patients)
Skjerve & Nygaard, 2000, [13]	It refers to recurring onset of confusion or agitation and restlessness in elderly patients in the evening; it is associated with significant caregiver burden	Evening	Yes (attention deficit and activity disturbance)	Yes (it is not associated with acute medical illness or with the high motility as in delirium)	Yes	Not reported	Yes	Not reported	Not reported	Not reported	Single case (demented patient)
International classification of sleep disorders, Diagnostic and coding manual, 2005, [19]	The sleep disturbance that is characterized by nocturnal wandering and confusion	Night time	Not reported	Not reported	Yes	Primary sleep disorder	Yes	Not reported	12%	Not reported	Diagnostic manual