

CASE REPORT

Reduction of Dream Bizarreness in Impaired Frontal Cortex Activity: A Case Report

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We report here the case of a 74-year-old woman suffering from chronic degenerative disease at initial stage that reported a deficit of cerebral activity in the frontal lobes, particularly in the dorsolateral pre-frontal and operculo-insular portions, for which there are neuropsychological and neuroimaging data available, as well as data on dreaming and dream bizarreness. While the patient reports no changes in sleep quality and in dreaming activity (she can still dream), she reports changes in the bizarreness and length of her dreams (both reduced) and in the frequency of nightmares (increased). Since the cerebral areas in which our patient shows a deficit are involved in some functions (e.g., moral decision-making abilities, inhibition and suppression of inappropriate response tendencies, etc.) covered by superego and dream censorship concepts, we suggest that the reduction of dream bizarreness may be interpreted in the light of Freud's explanation of dream bizarreness as a result of a deficit in censorship activity. (**Sleep and Hypnosis 2015;17(1-2):14-18**)

Key words: Disguise-censorship hypothesis, dream bizarreness, neuropsychology, superego, neuroimaging, psychoanalysis

INTRODUCTION

Clinico-anatomical studies of dreams have contributed to re-evaluate the Freudian model of dream (1) by attributing the primary mechanism of dream generation to the mesolimbic-mesocortical dopaminergic system, (2,3), the same system that affective neurosciences has shown to be involved in the

instigation of goal-seeking behaviors and organism's appetitive interactions with the world, which Freud referred to as "libidinal drives" (4-7). Nevertheless, one of the cornerstones of the Freudian dream theory, that is, the "disguise-censorship" hypothesis in the explanation of dream bizarreness, still remains debated with respect to the neuroscientific evidence (6,8-15).

Solms & Turnbull (6) and Turnbull & Solms (16,17) suggested that, at least in part, dream bizarreness might be the result of the "regressive" nature of dream process. The executive functions of the frontal lobes prevent clear expression of the latent contents of dreams which are back-projected to posterior cortices where they are symbolically elaborated.

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From this point of view, Hobson & Pace-Schott (18) and Braun (19) suggest that the Solms' dream model seems to renounced or minimise the notion of censorship and disguise.

Yu (14) identifies the neurological correlates of the "censorship activity", with the functions ascribed to the prefrontal convexity (lateral orbital and dorsolateral regions) (i.e., rational and logical system, inhibition and suppression of inappropriate response tendencies).

Boag (10) suggested that dream bizarreness is due, in part, to an inter-drives competition act to prevent a direct expression of wishes. He noticed that, the basal ganglia (involved in mediating the processes of competition between incompatible inputs) could be one structure implicated in this mechanism.

One way to investigate the neuroanatomical correlates of the hypothetical "disguise-censorship activity" may be the study of the possible changes in dream bizarreness in people with brain activity deficits in those cortical areas which are known to be associated with certain functions included in Freud's concept of superego (see: 14). We are describing here the case of woman suffering from degenerative chronic disease who reported a deficit of cerebral activity in the frontal lobes, for which there are neuropsychological and neuroimaging data available, as well as data on dreaming and dream bizarreness.

CASE REPORT

A 74-year-old right-handed woman presented to our clinical examination showed a chronic degenerative disease at initial stage.

A first Computer Tomography (CT) exam performed showed a chronic ischemic disease in the bilateral frontal regions. Subsequently, a 99mTc-HMPAO single-photon emission tomography (SPET) imaging performed two months later showed a deficit of cerebral activity in the left dorsolateral prefrontal (DL-PFC), in the operculo-insular portions of the frontal lobe, and in the right superior parietal region (BA 7).

Neuropsychological examination. The patient was vigilant and cooperative during the entire tests administration with a fluent and effective speech. Mini Mental State Examination (MMSE) showed a "mild impairment" in general cognitive function. Routine neuropsychological tests (see table 1) showed a fairly widespread cognitive impairment which affected the functions of short-term and long-term memory, and visual-spatial skills. The patient also showed sign of constructional apraxia, visual agnosia (i.e., anomie) and deficit in the generation of words by semantic criterion. Problems emerged regarding the executive frontal functions, in which the patient showed

Table 1: Neuropsychological tests somministrated

Mini-Mental State Examination (MMSE)
Rey Auditory Verbal Learning Test (RAVLT)
Deux Barrage test
Copying figures, completing figures
Coloured Progressive Matrices (CPM)
Generation of words by the semantic criterion
Generation of words by the phonological criterion
Naming
Trail Making Test (TMT -A)
Stroop Test

Table 2: The clinical interview on dreaming

We asked whether her sleep and dreams had changed since the onset of her neurocognitive problems. The patient's answers were classified by interviewer using predefined categories as follows:

Changes in sleep and dream recall: - "improved", - "worsened", - "no change";
Changes in dreaming: - "continues to dream as before", - "has ceased to dream", - "does not know";
Changes in dream length: - "longer", - "less long", - "unchanged";
Dream bizarreness: - "more bizarre, or less simple and banal", - "less bizarre, or more simple and banal", - "unchanged";
Pleasant / unpleasant emotional content: - "more pleasant" - "more unpleasant", - "unchanged";
Frequency of nightmares: - "increased" - "decreased" - "unchanged".

deficits in the ability to inhibit inappropriate or irrelevant responses tendencies, in the executive organization and in selective or focused attention. The logical–deductive / analogical–perceptive reasoning were at the lower limit of normal range.

The patient was submitted to a semi-structured interview with questions about her sleep and dreaming activity by an interviewer (a psychologist), who was blind for the purposes of the study (see table II). She reported that there were no changes in sleep quality and in dream emotions. She could still continue to dream although her dream recall was worse. The only changes she reported in dream contents were in bizarreness and in length (both reduced) and in frequency of nightmares (increased).

DISCUSSION

We note that the reduced ability to recall dreams of our patient, it is consistent with the deficits in memory functions, as well as, in visuo–spatial skills (on correlation between dream recall and visuo–spatial skills see: 20, 21).

Since it is well known that the bizarre and illogical elements of the dreams are intended, compared to non–bizarre elements, to be remembered more easily in the deferred recall (22–24), in our patient the memory deficits should have had an impact rather in the sense of a greater presence of bizarre elements in dream recall. In this sense, the answer concerning the reduction in “dream bizarreness” appears to be even more reliable. The shorter length of patient’s dreams is also consistent with the reduced dream bizarreness, since it is well known the significant positive correlation between these two dimension of dreaming (e.g., 25–27).

The areas in which our patient shows a deficit in cerebral activity involve several higher mental functions. The dorsolateral prefrontal

cortex plays a role in working memory and higher–order cognitive control executive functions (28). The insular cortex is involved in the processing of norm violation, social emotion, empathy, compassion and emotional processing (29–31). This region is also interconnected with the frontal operculum, the orbitofrontal cortex and with the amygdala (32–33). The orbitofrontal cortex is known to be involved in moral decision–making abilities and in social judgment and behaviours [34–37, (See Yu (14) for a review)]. The amygdala is crucial for normal moral socialization (e.g., 38,39).

We note that several of the above–described functions of the frontal cortex and its interconnections are implicated in the Freudian concept of superego.¹

Freud described “childish” type of dreams in adult which show the same characteristics as children’s dreams: short, simple and without bizarreness, a wish–fulfilment dreams instigate by unrepressed everyday wishes (40,41). In Freud’s view (1) young children’s have frequently undistorted wish–fulfilment dreams because they have not yet developed superego (i.e., censorship function in dreams)(see: 42). We assumed that reduce “dream bizarreness” of our patient may be due to a greater presence of “childish” dreams (rare in healthy adults), among the overall patient’s repertory of dreams.

The supposed deficits in superego functions (or in some cognitive abilities that could serve to this functions) of our patient might have altered her ability to waive or forbear from the fulfilment of unrepressed wishes of everyday life (i.e., less domain of thought over drives), now capable of acting (unlike from how happens in healthy adults), as strong wishful impulse that triggers the dream as it occurs in children. We note that this interpretation is consistent with Frank’s observations that patients with ablated orbital cortices show a lower complexity of dreams and their dream content reflects, like

¹From this point of view it is worth noting that our patient obtained an age–corrected scale score below average in the “Comprehension” subtest (WAIS–R) and score “0” into the items more relating to problematic situations in which the subject must respond using social and moral judgment.

children's dreams, direct wish-fulfilment (43).

On the other hand, the increase in the frequency of anxiety dreams² representing a repressed wish, with insufficient or no disguise, might be explained in the sense of a more frequent, complete or partial, failed dream-censorship activity in the inhibition and disguising of inadmissible latent contents.

This case report allowed us to begin to address the difficulties in the study of changes

in dream bizarreness following deficit of cerebral activity in neural regions which hypothetically underlie superego functions. Such type of investigation implies having to cope with some conceptual and methodological issues, such as, for example the measurement of dream bizarreness and the assessment of behavioural consequences of deficit in superego functions (a study in a group of patients in this sense is presently in progress).

²According to Freud, in these dreams "...anxiety takes the place of dream-distortion" (41, p. 674).

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