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Obsessive-Compulsive Disorder According to the Inference-Based Approach

Perturbação Obsessivo-compulsiva Segundo o Modelo Baseado na Inferência

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ABSTRACT

Background: Obsessive-compulsive disorder can be an important source of distress and disfunctionality to affected individuals. Its treatment is mainly pharmacological and psychotherapeutic (namely exposure with response prevention). The inference-based model appeared in the decade of 90, aiming to solve some of the limitations of the existing cognitive-behavioral formulations of obsessive-compulsive-disorder.

Aims: To present a review of the inference-based model and inference-based therapy applied to obsessive-compulsive disorder.

Methods: Non-systematic review of articles searched in PubMed and Medline, and scientific literature of reference.

Results: The core element of the conceptualization of obsessive-compulsive disorder according to the inference-based model is inferential confusion, that is, confusion between possibility and reality. A narrative is constructed that is distant from the events of the here and now and from common sense, supported by specific inductive reasoning processes that are believed to be altered in OCD. From here will arise the first thought with the characteristics of obsessive thought, called primary inference, followed by anticipated consequences called secondary inferences, which result in anxiety and consequently compulsions. The inference-based therapy was outlined from this formulation of the obsessive-compulsive dyad. This therapy aims to invalidate the reasoning processes that lead to the doubt or primary inference and return the person to the world of senses and common sense. It showed efficacy in empirical studies, namely when compared to classic cognitive-behavioral therapy in two randomized controlled trials, with more efficacy in patients with over-investment in the obsessions or poor insight.

Conclusions: Regarding its efficacy, inference-based therapy appears promising. It could be a hypothesis to consider in patients with obsessive-compulsive disorder, as well as in other disorders such as dysmorphophobia, eating disorders and hoarding disorder.

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Key-Words: Obsessive-Compulsive Disorder; Cognitive Behavioral Therapy; Inference-Based Approach.

RESUMO

***Introdução**: A perturbação obsessivo-compulsiva pode acarretar bastante sofrimento e disfuncionalidade para os indivíduos afetados. O seu tratamento passa por medidas farmacológicas e psicoterapêuticas (nomeadamente exposição com prevenção de resposta). O modelo baseado na inferência surgiu nos anos 90, tentando responder a algumas das limitações das formulações cognitivo-comportamentais existentes.*

***Objectivos**: Apresentar uma revisão do modelo baseado na inferência e da terapia baseada na inferência aplicada à perturbação obsessiva-compulsiva.*

***Métodos**: Revisão não sistemática de artigos pesquisados no PubMed e Medline e bibliografia de referência.*

***Resultados:** O elemento nuclear da conceptualização da perturbação obsessivo-compulsiva segundo o modelo baseado na inferência é a dúvida obsessiva, que é vista como uma inferência, à qual se chega por um processo de raciocínio indutivo. As obsessões originam-se a partir de uma narrativa imaginária interna, distante do "aqui e agora", baseada em argumentos lógicos. A partir daí, e por um processo de raciocínio denominado confusão inferencial, formula-se a inferência primária, que é o primeiro pensamento com a forma de dúvida obsessiva (obsessão). Seguem-se, a partir desta, as inferências secundárias, que são consequências antecipadas e que geram ansiedade ou desconforto, podendo levar a ações compulsivas. A partir desta formulação, desenhou-se a terapia baseada na inferência, que visa invalidar os processos de raciocínio que levam à dúvida ou inferência primária e retornar a pessoa ao mundo dos sentidos e senso comum. Apresenta eficácia em estudos empíricos, nomeadamente quando comparada à terapia cognitivo-comportamental clássica em dois ensaios controlados aleatorizados, com maior eficácia em doentes com sobre-investimento nas obsessões ou pouco insight.*

***Conclusões**: A terapia baseada na inferência demonstra-se promissora em termos de eficácia. Pode ser uma hipótese a considerar nos doentes com perturbação obsessivo-compulsiva, mas também em outras patologias como dismorfofobia, perturbações do comportamento alimentar e perturbação de acumulação.*

***Palavras-Chave:** Perturbação Obsessivo-Compulsiva; Terapia Cognitivo-Comportamental; Modelo Baseado na Inferência.*

BACKGROUND

Obsessive-compulsive disorder (OCD) is clinically defined by the presence of obsessions and/or compulsions, that are time-consuming or cause clinically significant distress or dysfunctionality[1]. In the past, this disorder was considered to be rare. However, recent studies point to a 12-month prevalence of 0.7-1.0%, and a lifetime prevalence of 2-3%, with some inter-regional variability[2,3]. It can cause high levels of social and laboral impairment, and

affected individuals are often reluctant to seek professional help[2].

Regarding its treatment, current guidelines support the first-line utilization of SSRIs (selective serotonin reuptake inhibitors) and CBT (cognitive-behavioral therapy), especially ERP (exposition with response prevention)[2]. Although ERP has response rates of around 60%, some associated problems include treatment resistance (20%) and dropout (25-30%), notably due to the anxiogenic potential of exposure[3,4]. Early clinical trials also found overinvestment in obsessional ideas in patients who were resistant to behavioral treatments[5].

In response to the limitations of ERP, cognitive approaches that allowed treatment with less exposure emerged, such as the appraisals-based model (CAM)[3]. In turn, the inference-based approach (IBA) was proposed in the 1990s (O'Connor & Robillard, 1995, 1999), complementing the cognitive conceptualization of OCD according to CAM[4,6,7]. The IBA model focuses on some points not addressed in other cognitive models, such as the origin of obsessions and their specific content, based on empirical evidence[4,8].

The inference-based therapy (IBT) is the clinical application of the IBA model and, although it has demonstrated efficacy in studies, it is not widely known, namely in Portugal. Furthermore, and despite its potential usefulness to certain patients, it's not included in the main guidelines for the treatment of OCD. This article aims to offer a review of the IBA model and its applications in clinical practice.

AIMS

The aim of this article is to present the conceptualization of OCD according to the IBA model, which are the main goals of IBT and the results from studies on its efficacy.

METHODS

Non-systematic review of articles searched in the Pubmed databases using the terms *"obsessive-compulsive disorder", "inference-based approach"* and *"inference-based therapy",* as well as literature of reference cited in the articles and from the authors of the IBA model. From the 41 articles collected, published until August of 2019, 19 articles were selected by review of their abstracts. Two books focusing on the theme were also consulted and cited. We excluded articles whose abstracts did not provide information relevant to the purpose of the review. We included papers describing the IBA model and IBT, as well as studies on its efficacy, in a clear, explicit, coherent and organized way, after critical analysis.

RESULTS

The second half of the 20th century brought important advances in both pharmacological and psychotherapeutic treatment of OCD. Victor Meyer employed a form of behavioral treatment in 1966 called Exposure with Response Prevention (ERP), which remains the most effective behavioral therapy for OCD to date[2,3]. Later, cognitive models to conceptualize OCD would be developed, with a particular emphasis on the role of cognitive distortions and beliefs in the development and maintenance of this disorder. Based on Beck's (1976) model of psychopathology, which proposed that different types of psychopathology emerged from different types of dysfunctional beliefs, Salkovskis (1996) formulated that it was not

the thought or intrusion *per se* that generated anxiety and compulsions, but the way such thoughts are evaluated in the light of one's personal responsibility. Rachman (1997) would later point out that this assessment depended on beliefs about the exaggerated importance of thoughts and their personal meaning. Based on these and other works, the Obsessive Compulsive Cognitions Working Group (1997, 2005) considered 3 domains of dysfunctional beliefs that lead to putative negative cognitive assessments underlying the development of obsessive-compulsive symptoms: (a) overestimation of threat and inflated responsibility, (b) beliefs about the importance and need to control intrusive thoughts; and (c) perfectionism and intolerance to uncertainty[9-11]. Generally speaking, these are the foundations of the appraisal-based model, in which thoughts are seen as intrusions - normal and universal occurrences – that receive a meaning based on beliefs such as those mentioned above[10,11].

The IBA model attempts to explain the development of OCD by conceptualizing it as a disturbance of the imagination characterized by pathological doubt[12]. Historically, it branches from Janet's (1903) work in identifying doubt as the main issue in OCD[5,7], and from works that identified OCD as a disturbance of beliefs / reasoning[5,6]. The early formulations of the model were developed to address the problem of over-investment in obsessive ideas or overvalued ideas in OCD[4,5].

This model regards the obsession as an inference (and not as an intrusion), resulting from an inductive reasoning process[7]. The obsessive chain begins with an internal or external trigger, linked to one's own circumstances[13]. Obsessions subsequently originate from an imaginary internal narrative, distant from the "here and now," based on logical arguments such as abstract facts and ideas, general rules, hearsay, personal experiences, and possibilities[9,12,14]. From there, the primary inference is formulated, which is the first thought with the form of obsessive doubt (obsession) that goes beyond reality. The secondary inferences (or anticipated consequences) follow, and they tend to generate anxiety or discomfort, potentially leading to compulsive actions[12,14]. (see figure 1). For example, touching something (external trigger) could raise the obsessive doubt that "maybe I have been contaminated by dangerous germs", followed by anticipation of anxiogenic consequences (*e.g.* "I can get sick" or "I can contaminate other people") - which may lead to a compulsive action, *e.g.* washing / cleaning. Some examples of logical arguments that can be considered in this situation might be: "germs exist" (abstract facts), "I once heard someone say that he got sick after touching a metro pole" (hearsay) or "there is always a possibility of contract a disease" (possibility)[14].

Obsessive doubt thus differs from "normal" or non-obsessive doubt. In normal doubt something is questioned in line with direct evidence or information from the senses, and that doubt is quickly resolved when appropriate information or evidence is obtained. (*e.g.*, "Did I turn off the stove?" - I look at the stove, which is turned off, and the doubt is resolved). Obsessive doubt, on the other hand, occurs when there is already certainty from a common sense point of view, or when evidence is excluded and the person goes beyond sensory

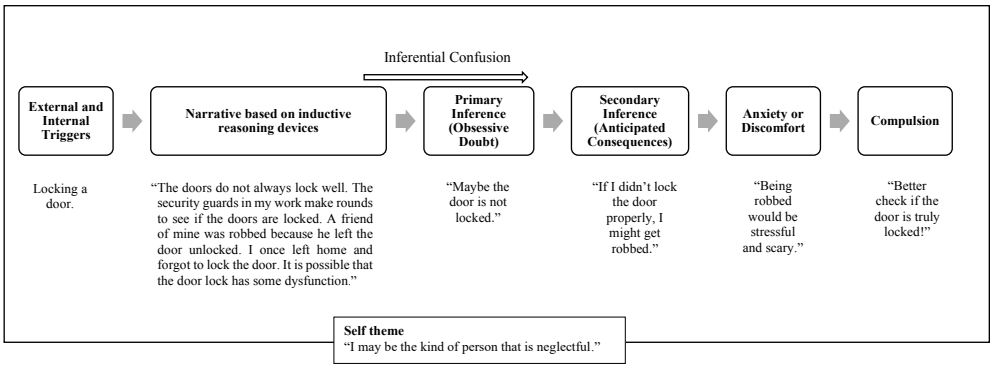

Figure 1. Cognitive conceptualization of OCD according to the IBA model (adapted from Julien, O'Connor & Aardema, 2016 and O'Connor & Aardema, 2012)[12,14].

information. Obsessive doubt will increase the more you think and invest in it (*e.g*. After seeing that the stove was turned off, I think, "But maybe I didn't see well." I check 20 times, but I'm not sure, and the more I think about it, the more uncertain I get)[9,14].

The reasoning process that leads to the primary inference is called inferential confusion. It occurs when a person confuses an imagined possibility with a real probability and acts as if the first was true. Inferential confusion has two components: (a) investing in remote and often imaginary possibilities at the expense of reality and (b) lack of confidence in the senses and common sense. These two processes are an integral part of the same construct and therapy should focus on both together[12,15,16]. In practical terms, the person with OCD will act (compulsion) to try to avoid phenomena present in their imagination (obsession), obviously without success. Regarding the example above, someone with obsessive thoughts of contamination who thinks he may have soiled his hands (although he has no evidence of such) will act on that idea and wash them repeatedly. Therefore, he tries to eliminate an imaginary doubt with real washing, but given the dissonance of the imaginary narrative and real sensory information, he will not succeed[5]. (see figure 2).

It should be noted that the possibility raised may in fact correspond to something theoretically real. For example, a person may leave the car door unlocked, have germs in her hands, or be late for an appointment. However, in OCD this possibility goes beyond what is perceived by the senses or common sense, far from the "here and now" evidence[12].

Several other reasoning "devices", consisting of inferential processes, reinforce credibility in doubt. As their use is valid under certain circumstances, they cannot be called errors. The problem with the obsessive reasoning is that the information they provide forms the basis of overinvestment in a remote possibility at the

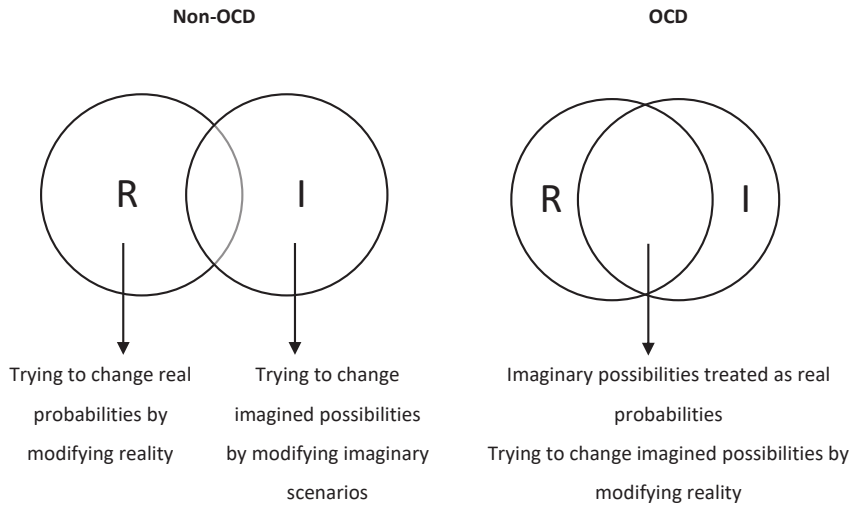

Figure 2. Relation between reality and imagination in the person with OCD and without OCD (Adapted from O'Connor & Aardema, 2003)[16].

expense of a realistic view and the "here and now"[5,15]. It should also be noted that deductive capabilities appear to be intact in the person with OCD, so valid deductive conclusions can be drawn from a fallacious premise that was inductively generated[17]. Some examples of these reasoning "devices" are:

- Category errors: confusion between two categories of information or objects ("that table was dirty so this one may also be dirty");
- Apparently comparable events: confusion between two distinct events separated in time and space ("my friend left the garage and left the door open ending up being robbed, it may happen to me");
- Selective use of out-of-context facts: abstract facts are inappropriately applied to specific personal contexts ("I heard in the news that someone died of a sudden heart attack so I could also die unexpectedly");
- Purely imagined sequences: Creating compelling imaginary stories and living them ("I saw a red spot and figured it could be blood, and I could touch it and end up being contaminated");
- Inverse inference: inferences about reality precede (rather than follow) from observations of reality ("As this table has been touched by many people, it is likely to be dirty even though I see nothing");
- Distrust of normal perception: disregarding the senses rather than being in reality ("I may not see anything, but there are many invisible threats")[9,15].

Another important component of the IBA model that is addressed in therapy is the theme of the vulnerable self. This refers to the

self that a person fears becoming or is afraid of being, and which may underlie certain obsessions (*e.g.*, someone afraid of being careless will have extra vigilance when checking things out)[15,18].

It is important to note that the IBA model is not incompatible with the CAM - they seem to focus on different parts of the process. Inferential processes are associated with the origin of obsessions while appraisals are linked to subsequent processes (evaluation of anticipated consequences). Appraisals tend to intensify the anxiety and discomfort associated with the antecipated consequences and end up reinforcing the maintenance of the obsessive current[7,17,19].

The IBA model is transposed into clinical practice in the form of IBT cognitive therapy. Each course of therapy is usually composed of 12-20 sessions, but the duration is adaptable depending on the patient. In addition to what is discussed in sessions with the therapist, there are worksheets and "homework" exercises[14]. The main purpose of IBT is to invalidate the reasoning processes that lead to primary doubt or inference and return the person to the world of senses and common sense. The most important steps consist of:

- Establish the nature of obsessive doubt and distinguish it from normal doubt;
- Discovering the subjective nature of the narrative story behind the primary inference;
- Understand how the obsessive doubt clashes with the sensory perception of the "here and now" and common sense;
- Identify how reasoning "devices" lead to the primary inference;
- Identify the crossing-over point, where there is disconnection with the senses to dive into the imaginary narrative;
- Use techniques to return the person to the world of senses and common sense, such as alternative narratives and reality sensing;
- Understand the selective nature of obsessive doubt (eg. "why do you have an obsessive doubt about whether you have closed the door or not but you do not have doubts when you cross the road or when you wash your hands?");
- Address the self vulnerability theme and its relation with OCD doubts[9,15].

Finally, regarding the empirical evidence of the efficacy of IBT application in samples of patients with OCD, there are:

- Two randomized controlled trials, the first comparing three groups - ERP (n = 12) *vs* CAM (n = 16) *vs* IBT (n = 16) (O'Connor *et al*., 2005); and the second comparing two groups - CBT (n = 47) *vs* IBT (n = 43) (Visser *et al*., 2015). Both showed similar efficacy of the studied therapies in reducing the severity of obsessive-compulsive symptoms, while IBT showed greater efficacy in patients with greater conviction / worse insight[5,20];
- A recent open label trial (Aardema *et al*., 2017) with 102 patients who completed an IBT program (*vs* natural wait list group of 22) also revealed efficacy in reducing obsessive-compulsive symptoms (effect size 1.80; improvement in 71.7% and clinically significant improvement in 59.8% of patients). It has shown promise in individuals with higher levels of overvalued ideation[15];

- Three trials without a control group (Aardema *et al*., 2009 [n = 19]; Aardema & O'Connor, 2012 [n = 35]; Borrello & O'Connor, 2014 [n = 59]) that verified a tendency to improvement of obsessive-compulsive symptoms in individuals undergoing IBT[13,21,22].

A randomized controlled trial is currently underway to verify the efficacy of IBT *vs* ERP in patients with OCD (NCT03677947)[23].

IBT has some limitations regarding access to treatment, such as being time-consuming and the shortage of trained therapists, specially since it's still not widely known and not included in the main guidelines of OCD treatment. Concerning its efficacy, there are problems related to the generalizability of studies, such as differences between study and "real world" clinical samples and the use of protocols in research; more empirical support is needed, as well as replication studies[12,24].

CONCLUSIONS

IBT derives from a relatively recent conceptualization of the cognitive process underlying OCD. Empirically, it demonstrates a similar efficacy to ERP or CAM, with better results in patients with overinvestment in obsessions or poor insight. These alone represent a subgroup of patients who offer greater therapeutic challenges and a worse prognosis[5,12,20]. Although it was originally designed to conceptualize OCD, IBT's field of action has been expanded, with increasing evidence of its applicability in pathologies such as hoarding disorder, body dysmorphic disorder and eating disorders[12]. Therefore, it is worth considering the IBA model in OCD, and empirical evidence point to a potential greater role in the therapeutic formulations of this disorder in the future.

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