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Social blushing: a neuropsychiatric disorder?

El sonrojo social: ¿un trastorno neuropsiquiátrico?

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Abstract

Until recently, social blushing was rarely discussed in the medical literature. It was usually considered only a normal and occasional physiological reaction associated with emotions such as embarrassment brought on by social situations. This has changed in recent years with attention increasingly being paid to blushing, either in the context of social anxiety disorder or in its own right. Some argue that blushing has adaptive value, so it may not make sense to treat people for blushing, a view we do not agree with since the blushing experience is not the same for everyone and those who seek medical help do so because their blushing impairs their quality of life. Furthermore, the fact that a symptom is adaptive does not place it beyond the scope of medical treatment. Quite the contrary: physicians treat many symptoms that cause discomfort, e.g. pain and vomiting, which may be regarded as adaptive, yet few doubt the value of treating such problems. The same is true for blushing. Recognizing its potential adaptive value does not mean that it should not be treated. The distress of those who blush easily and seek help justifies attempts to find ways to help them. This article underlines the need to distinguish between normal social blushing and pathological social blushing and, at the same time, reviews current available treatments for individuals who seek help for this condition.

Resumen

Hasta hace poco tiempo, rara vez se debatía sobre el sonrojo social en la literatura médica. Se le consideraba solo una reacción fisiológica normal y ocasional, provocada por situaciones sociales. Esto ha cambiado en años recientes pues se le presta cada vez mayor atención, ya sea en el contexto del trastorno de ansiedad social o por derecho propio. Algunos argumentan que sonrojarse tiene valor adaptativo y que por lo tanto no tiene sentido tratar a las personas que se sonrojan, visión que no compartimos porque la experiencia de ruborizarse no es igual en todos los individuos y porque los que consultan lo hacen debido a que las sucesivas experiencias de rubor van minando su calidad de vida. Más aún, el que un síntoma sea adaptativo no lo pone fuera del ámbito de la medicina. Al contrario: hay numerosos síntomas que tratamos los médicos, desagradables para el individuo -el dolor y los vómitos son buenos ejemplos-, los cuales pueden considerarse adaptativos y sin embargo pocos podrían en duda la legitimidad de tratarlos. Lo mismo es válido para el sonrojo. Reconocer su potencial valor adaptativo no hace ilegítimo su tratamiento. El sufrimiento de aquellos que se sonrojan fácilmente y buscan ayuda por ello, justifica los intentos de encontrar modos de ayudarlos. Este texto subraya la necesidad de distinguir entre el sonrojo social normal y el sonrojo social patológico y, a la vez, revisa los tratamientos actualmente disponibles para las personas que consultan por esta condición.

Introduction

Until recently, social blushing was rarely discussed in the medical literature and in medical practice, and it remained a relatively unstudied condition. This neglect of blushing is surprising given that the facial expression of emotion has attracted so much research for many years [1]. Two circumstances might have contributed to this state of affairs: on the one hand, blushers were often too embarrassed to ask for help (this has clearly changed with the Internet), and on the other, most people assumed that facial reddening was only a natural human reaction to certain situations.

Charles Darwin in his book *The Expression of the Emotions in Man and Animals* described blushing as "the most peculiar and the most human of all expressions" [2]. He devoted an entire chapter to the topic, a phenomenon he described as consisting of a reddening of the face (especially the cheeks), ears, and neck, and occasionally other parts of the body, brought on by the "thinking of what others think of us." In a more recent review, blushing is defined as a "spontaneous reddening or darkening of the face, ears, neck, and upper chest that occurs in response to perceived social scrutiny or evaluation" [3]. Contrary to reddening of the face caused by conditions such as heat, alcohol or specific dermatological diseases such as rosacea, which should be called *flushing* as it is devoid of a psychological component, blushing is accompanied by feelings of embarrassment and disruption of mental function.

Now, is blushing only a normal, involuntary, response to certain social situations? Might not the most human of expressions become a torment? Previously, we have tried to show, through the description of clinical cases, that sometimes blushing is a source of suffering and can, in cases that warrant it, be treated [4]. The present article underlines the need to distinguish between normal social blushing and social blushing with a morbid connotation and, at the same time, reviews current available treatments for individuals who seek help for this condition.

Different types of blushing

We regard blushing in interpersonal encounters as normal if it occurs in proportion to the situation causing it, does not produce psychological suffering, and does not interfere with the individual's daily life. Simply blushing in social situations cannot be considered a morbid symptom, an illness or a disorder. Moreover, turning red in certain situations is not only appropriate, but expected (e.g., when receiving public recognition or when being involved in a social mishap).

In contrast, we consider blushing to be abnormal if it is severe or frequent, if it causes the person to suffer, and if it interferes with the person's usual level of performance and/or social interactions. If blushing is abnormal, fear of blushing (erythrophobia) is almost always present.

Curiously, the scientific literature does not normally differentiate between the two types of blushing described above: the blushing that is expected in certain contexts and does not limit the individual, compared to the blushing that causes emotional pain and interferes significantly with a person's academic/occupational functioning or interpersonal relationships. For the latter we have previously coined the term *pathological blushing* (PB) to stress the importance of making the conceptual distinction between normal facial blushing and its pathological counterpart [5].

From the point of view of its speed of appearance and location, two types of facial reddening have been described: first, the typical blush, which appears quickly (in a matter of seconds) on the face, neck, and ears, and spreads uniformly over the affected areas; and second, the "creeping blush," which occurs more slowly, appearing first as red splotches, usually on the upper chest or lower neck. As the minutes go by, it spreads upward onto the upper neck, jaws, and cheeks. Even at its peak, a creeping blush is blotchy rather than uniform in color [3]. The distinction is worth keeping in mind because, as we will see later, it influences the response to treatment.

Psychiatric perspective

Pierre Janet (1903), included fear of blushing (erythrophobia) within the group of phobias related to social situations [6]. However, within today's concepts of mental disorders, the illness most associated with facial coloration is social anxiety disorder (SAD), formerly known as social phobia. This disorder affects 13 percent of the population at some time in their lives [7]. According to one study, up to 50 percent of social anxiety disorder patients say they blush frequently [8].

The tenth version of the World Health Organization's International Statistical Classification of Diseases and Related Health Problems (ICD-10) [9] defines social phobia, or social anxiety disorder, as a marked fear of being the center of attention or of behaving in an embarrassing or humiliating way, leading to social avoidance. The last version of the American Psychiatric Association's Diagnostic and Statistical Manual (DSM-5) [10] characterizes social anxiety disorder as the presence of persistent, marked anxiety in different social or public situations for fear that they might be embarrassing. Interestingly, unlike their predecessors, this is the first version to state that "blushing is a hallmark physical response of social anxiety disorder", which does justice to this largely ignored symptom.

Now, if blushing and its emotional concomitants are a normal component of social anxiety disorder, why focus on facial reddening, and specifically on that with a pathological connotation (pathological blushing), rather than on social anxiety disorder? There are various reasons.

Firstly, we aim at focusing on the concerns of patients, and patients are distressed, not by social anxiety disorder per se, but by the telltale color in their cheeks. This is clearly shown in that they often resort to surgical treatments,

frequently before consulting a mental health professional [11],[12].

A second reason for focusing specifically on blushing is to draw attention to a phenomenon that is generally trivialized and nearly always assumed to be a normal experience when, in fact, that experience can actually become a morbid symptom.

Third, the general belief that today's psychiatric diagnostic criteria correspond to actually existing biological conditions is an illusion. The Spanish psychiatrist Julio Sanjuan has probed this question based on the enormous paradox that we do not yet have a single biological marker that is specific enough to be included within the diagnostic criteria of even one psychiatric disorder [13]. This is why many researchers today look more into the correlation of concrete symptoms, such as hallucinations, lack of concentration, and anxiety rather than the biology behind the illnesses of uncertain nosology included in today's classifications. Thus it would be perfectly reasonable to look for the biological factor(s) correlative to pathological blushing.

Finally, while our experience has shown that pathological blushing commonly occurs with social anxiety disorder, chronic blushers can suffer certain symptoms of social anxiety without fulfilling all of the criteria required for that diagnosis [14],[15].

Self-conscious emotions

Self-conscious emotions such as shame, guilt and pride are grouped together because of the central role that self-appraisal plays in each of them. They also have been termed higher, or secondary, emotions because they are presumed to require more extensive processing by the cerebral cortex than do basic, lower or cognition-independent emotions, such as fear and sadness. The blush can be considered a bodily change that accompanies some self-conscious emotions, such as embarrassment, but not others such as pride or guilt [16].

Several of these self-conscious emotions depend in part on what the person experiencing them thinks about others, but they also hinge on what that person believes others are thinking about him or her. For example, embarrassment is an unpleasant emotional state that we experience when we know that we have been caught in an individual act or condition that is socially or professionally unacceptable. Embarrassment is similar to shame, except that we can feel ashamed of something that we alone know about ourselves, while embarrassment requires the presence of another person*. In addition, embarrassment is generally understood to be brought on by an action that is merely socially unacceptable rather than one that is morally reprehensible. The function of self-conscious emotions, according to some researchers, is to motivate us to adhere to social norms [17].

Evolutionary perspective

Emotions are inherent to the human experience and, when they are normal, they promote an appropriate adaptive response to situations of tension, danger, or threat. Moreover, many people believe that there are no negative emotions and that only two factors can make them potentially negative: their duration and their associated cognitions. Following this logic, anger, within certain limits, is a useful reaction when we feel our territory is threatened, sadness can help us to heal ourselves through introspection, fear protects us from the dangers around us, and guilt allows us to redeem ourselves. Blushing, analogously, can fulfill a social function, serving as a means of communication. This observation leads us immediately to the need to differentiate blushing as a subjective experience from blushing as a signal; that is, as a message to others of the same species. Empirical evidence supports the hypothesis that the facial reddening that accompanies embarrassment may soften a negative evaluation from those around us. Studies have been carried out in which subjects are shown a series of short scenes involving minor public disturbances, such as someone knocking over a stack of cans in a supermarket. The actor in the first film blushes; the one in the second looks around, embarrassed; and in the third film the actor walks out of the store with no reaction whatsoever. When the subjects watching the tapes were asked to judge the situations, they considered the situations to be less serious when the actor blushed or looked embarrassed. The actor that blushed was considered the least guilty of the three and was evaluated more positively than the ones who looked embarrassed or left the supermarket as if nothing had happened. The one who reddened was perceived as more trustworthy, friendly, and deserving of affection than the one who simply looked embarrassed [17].

Although Darwin recognized he could not explain the phenomenon of facial reddening, the evolutionary viewpoint has established correlations between human blushing and the appeasement displays exhibited by certain animals. In effect, the animals' display behaviors reduce the possibility of an attack by members of their own species. Similarly, it has been said that the blushing response emerges not so much as a reaction to danger but as an attempt to prevent danger from rising [18].

In view of this evolutionary logic, one might ask why, if blushing serves to defuse a threat, people so want to avoid it. For the few doctors who work in this area, our experience has shown us that most patients seek help not because of normal, occasional facial reddening, which we know is a natural part of life, but because they blush excessively** [19] and at socially inappropriate times, and because the experience turns disabling and undermines their quality of life.

It is our view that those who state that it does not make sense to treat people for blushing because it is adaptive often do not make the distinction between normal and pathological blushing. Furthermore, the fact that a symptom is adaptive does not place it beyond the reach of medical treatment. Quite the contrary: physicians treat many symptoms that cause discomfort, e.g. pain and vomiting, which may be regarded as adaptive, yet few doubt the value of treating such problems. The same is true for blushing. Recognizing its potential adaptive value does

not mean that it should not be treated. The distress of those who blush easily and seek help justifies attempts to find ways to help them.

Psychopharmacological treatment

Selective serotonin reuptake inhibitors (SSRIs)

Some years ago we conducted a study on the efficacy of treatment in patients with social anxiety disorder who sought help for their blushing. Our results [12] confirm the findings by Connor *et al*. [20] that social anxiety disorder patients report specific effects of sertraline on blushing, but not on trembling and sweating. Besides, another study showed that fluvoxamine was superior to a placebo for treating facial blushing associated to anxiety disorders in children [21]. As regards fear of blushing, French authors found significant reductions after four weeks of treatment with escitalopram, a result which was more pronounced at the end of the 12-week treatment, with patients experiencing a 60% decrease in their symptoms ($p < 0.001$) [22].

Beta-blockers

It makes sense to use beta-blockers for blushing since studies have shown that the acute stage of blushing is regulated primarily by beta-adrenergic sympathetic nerves, which are responsible for the dilation of blood vessels in the face [23],[24]. These medications can be employed on an ongoing basis (atenolol, metoprolol, propranolol) or only occasionally (propranolol). In our experience, 20 to 40 milligrams of propranolol, taken along with 0.25 milligram of alprazolam forty to sixty minutes prior to a situation that typically triggers blushing, is usually quite effective. Our patients often call this the "magic combination." It is a good treatment option, but it has the drawback that if patients are able to deal successfully with social situations, they tend to attribute the success to the medication rather than taking the credit themselves. In other words, it is a strategy that reinforces the use of drugs rather than cognitive behavioral techniques, which, advantageously, involve learning processes.

Other drugs

Clonidine, a selective a_2-adrenergic agonist, has been used to treat facial blushing [25], menopausal flushing [26], and facial flushing redness associated with rosacea [27]. Likewise, anticholinergics have been used for facial blushing [28]. Interestingly, a recent study suggests that ibuprofen, a widely used anti-inflammatory, reduces blushing (arising in situations of discomfiture or embarrassment) when applied to the cheeks in gel form. It also seems to help control flushing caused by exertion. Ibuprofen works by decreasing the formation of prostaglandins, which contribute to the inflammatory processes in the face that result in blushing [29].

Psychotherapy

Psychotherapy, rather than trying to decrease the intensity and/or frequency of the episodes of facial blushing, focuses on controlling the fear of blushing, or erythrophobia. This process indirectly helps people to blush less, as the expectation of blushing has been proven to act as a self-fulfilling prophecy and can actually lead to facial reddening [30].

Task concentration training (TCT)

Until now, there have been only two or three therapeutic methods designed specifically to treat the fear of blushing. The most widely known is *task concentration training*, or TCT, developed by Bögels and her colleagues [31]. This technique is based on the idea that people who blush are too self-conscious during social interactions (excessively focused on their emotions, behavior, physical appearance, and level of activation) and pay little attention to the tasks at hand, the other(s) involved, and their surroundings. In these individuals, any sign of activity in their sympathetic nervous system, such as a faster heartbeat, perspiring hands, and—especially—warm cheeks, increases their focus on themselves. As their blushing becomes clearly visible to others, they become even more self-conscious.

Task concentration training therapy consists of teaching patients to direct their attention away from themselves when they blush and to focus on the tasks involved in the specific social interaction (waiting on customers, for example) rather than on themselves. The therapy consists of three stages: (1) becoming familiar with the processes of paying attention and becoming aware of the negative effects of increasing one's attention on oneself; (2) focusing one's attention away from oneself in nonthreatening situations (such as watching TV, making a phone call, walking in the park, or listening to the lyrics of a song); and (3) focusing one's attention away from oneself in threatening situations.

In the first stage, the patient learns how blushing and attention on oneself reinforce each other and how this interaction begins to produce anxiety, negative thoughts about oneself, problems concentrating, and awkwardness. Next, patients are shown how, by focusing their attention outward (toward the tasks involved in the social action and their surroundings) rather inward, they can begin to break the vicious circle that perpetuates their blushing. Patients are asked to keep a daily record of their blushing episodes, noting how anxious they were and estimating what percentage of concentration was on themselves, on the interaction, and on their surroundings at that time. Patients do concentration exercises under the guidance of the therapist that involve both listening and telling stories. Later, these daily records are used in "homework" assigned by the therapist.

During the nonthreatening focusing exercises, patients are told, for example, to walk through a (quiet) park paying attention to all of the stimuli around (visual, auditory, olfactory, kinesthetic) and in their own body. Patients are instructed to focus first on one aspect at a time, and then on all stimuli simultaneously (integrated attention). One homework assignment frequently given is to have a telephone conversation and then to summarize it.

To practice threatening situations, patients make a list of around ten social situations that are important in their life and that trigger blushing. The list is organized in an

increasing hierarchy, in which the first item is the least threatening for the patient. The goal is for patients to concentrate on the task involved in each situation and to return their focus to the task every time they become distracted by (thinking of) blushing or by focusing on themselves. Whenever possible, these more complex exercises are practiced first in the therapist's office, but they later become homework assignments of which patients keep written records. Any difficulties that arise are discussed with the therapist in the following session.

Learning to concentrate on the task at hand is considered a coping strategy, and it must be taught by a properly trained therapist. The training is generally done in six to eight weekly sessions lasting forty-five to sixty minutes each.

Cognitive behavioral therapy

Once task concentration training has been completed, generally another six to eight weekly sessions are given on cognitive behavioral therapy (CBT). The procedure is similar to that used with patients suffering from social anxiety disorder /social phobia, but special attention is paid to the safety-seeking behaviors that people adopt when they fear blushing but that are generally counterproductive. The therapy seeks to change these behaviors, which are generally things the person does, or does not do, in order to remain calm or to keep the blushing down, or at least less visible. One of the most common, of course, is avoiding or minimizing social contact, perhaps, for example, by sitting in the last row in a conference thinking that one might need to get up to go to the restroom. Other strategies are to use makeup, cover the face with the hair, stand against the light, wear sunglasses, or grow a beard (for men). Others are more complex, such as trying to control every aspect of a presentation one is going to make: learning it by memory, making sure that the room is as dark as possible, taking a tranquilizer beforehand, and etcetera.

I remember one patient who, every time she had to give a presentation in public, would spend the previous day in the sun without sunblock. This way, she argued, she *arrived* at the presentation red and thus avoided*turning* red. This behavior certainly entailed a risk to her health, but, in addition, it was not foolproof: naturally, the day prior to her presentation might be cloudy.

While these safety-seeking behaviors may provide some short-term relief for people who blush, in the end they are counterproductive because, if the catastrophes that the patients anticipate do not occur, they attribute it to these behaviors instead of concluding that the situation was less threatening than they had thought. In other words, these behaviors keep them from learning that the consequences they fear are actually distorted ideas, and it prevents them from adopting coping strategies that are more productive. Several techniques are used to reduce these behaviors, such as practicing with simulations or re-creations of each problematic situation before trying the skills learned in real-life circumstances.

Other therapies used with people who fear blushing are social skills training [32], mindfulness-based cognitive therapy [33] and paradoxical intention [34].

Length of treatment

Since studies generally cover only the first few months of medication use, there is no scientifically based answer to the question about how long drug treatment (e.g. selective serotonin reuptake inhibitors) should be maintained. Clinical practice, however, tends to show that blushers who stop taking the medication are more likely to have the symptoms recur than do those who continue with the drug for longer periods of time.

As for cognitive behavioral therapy, as we have seen, it is a short-term treatment usually lasting only a few months. As it involves learning processes, it has the advantage of providing longer-lasting results.

One option to consider, since patients tend to respond more quickly to medication than to cognitive behavioral therapy, is to begin treatment using both methods simultaneously and, after a time, to gradually decrease the use of drugs. Another alternative is to begin with a course of drug therapy, cut back gradually after a time, and then immediately begin cognitive behavioral therapy to prevent symptoms from recurring.

Surgical treatment

For patients with severe, objectionable blushing that have not responded to cognitive behavioral therapy or drug therapy, another option to consider is endoscopic thoracic sympathectomy [28].

Briefly, the use of this surgical technique is based on the assumption that these patients' sympathetic nervous systems do not work properly. For example, one research study associates erythrophobia with a tendency for the facial redness to dissipate more slowly [35]. In turn, another research showed that social anxiety disorder patients who identified themselves as blushers showed a different physiological blushing response during social interaction than patients who did not complain about blushing [19].

Doctors learned of the benefits of the sympathectomy in treating facial sweating in the 1930s, and it has been known as a treatment for hand sweating since the fifties. Though the operation was proposed for treating facial blushing for the first time in 1985 [36] it was only in the 1990s, with the advent of videosurgery techniques, that it became a simple procedure.

Although any surgery involves risks, the procedure is quite safe. The operation takes about an hour, and the patient generally remains hospitalized overnight. Some cases may be handled on an outpatient basis.

The symptoms improve rapidly, with the results of the operation normally being seen within hours, days, or weeks. Most patients (80 to 90 percent) report a significant reduction in blushing and a definite improvement in their

quality of life, with decreased intensity, frequency, and/or duration of blushing episodes [12],[28],[37]. For most individuals, this result translates into improved self-confidence, greater participation in social activities (which they used to avoid), and, not infrequently, improvements in their jobs and personal relationships.

The longest follow-up study done so far on patients who have undergone endoscopic thoracic sympathectomy covered 536 surgeries and showed a patient satisfaction rate of 73 percent after fourteen years. The authors believe that the decreased satisfaction among patients compared to that expressed after a shorter follow-up period may be due to the fact that their memories of blushing tend to fade over time, while the compensatory sweating persists [38].

It must be borne in mind that only quickly spreading blushing triggered by social situations responds well to the surgery. Upper chest or neck blushing as well as slowly emerging and long-lasting facial flushing respond poorly [38],[39].

Complications are rare, but they have been reported [28]. Compensatory sweating, which is the tendency to perspire more heavily in other parts of the body, is the most commonly reported, irreversible, side effect. It is seen in almost all patients treated with endoscopic thoracic sympathectomy. The degree of sweating varies from person to person, but 10 percent of patients regret having had the surgery, most frequently due to excessive compensatory sweating [40].

Given the risks associated to the surgical procedure, blushers should have surgery only as a last resort. As previously stated, blushing often presents in the context of social anxiety disorder, a condition for which evidence of treatment efficacy, both pharmacological and psychotherapeutic, is widely available.

Conclusion

Since the advent of the Internet, blushers, previously too embarrassed to ask for help, increasingly seek assistance, even surgery, from health professionals. In exchange, researchers now attend more to blushing in its own right or as part of social anxiety disorder. Though many social anxiety disorder patients blush, a considerable number of blushers do not fulfill the criteria for this disorder. The scientific literature does not normally differentiate between the blushing that is expected in certain contexts and does not limit the individual, and the blushing that causes emotional pain and greatly interferes with a person's academic/occupational functioning or interpersonal relationships. To stress the importance of making the conceptual distinction between normal blushing and its pathological counterpart, we have coined the term*pathological blushing.* This condition has been a frequent cause of consultation among patients worldwide only in the last 10 to 15 years. However, already different types of treatments have shown their efficacy, albeit they are not devoid of limitations and, therefore new therapeutic strategies, particularly in the psychological and pharmacological domains, are being tried.

Notes

***** However, there are descriptions of, and I have interviewed, people who have reported blushing in private. When this occurs, the situations they describe are interpersonal despite the fact that *they are alone. Several patients have described blushing while talking on the telephone (or, for example, while receiving an obscene phone call). These are cases of people who, despite being physically alone, are experiencing an interpersonal encounter and, besides, are exposed to a social situation that they did not seek out and that they find unpleasant.

****** This research study shows that patients who complain about blushing, blush more and/or have a heightened general arousability in social situations than those who do not complain about blushing.

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Conflicts of interest
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