



Social networks and bronchial asthma

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Purpose of review

To focus on both positive and negative aspects of the interaction between asthmatic patients and the social networks, and to highlight the need of a psychological approach in some individuals to integrate pharmacological treatment is the purpose of review.

Recent findings

There is evidence that in some asthmatic patients, the excessive use of social networks can induce depression and stress triggering bronchial obstruction, whereas in others their rational use can induce beneficial effects in terms of asthma management.

Summary

The increasing asthma prevalence in developed countries seen at the end of last century has raised concern for the considerable burden of this disease on society as well as individuals. Bronchial asthma is a disease in which psychological implications play a role in increasing or in reducing the severity of bronchial obstruction. Internet and, in particular, social media are increasingly a part of daily life of both young and adult people, thus allowing virtual relationships with peers sharing similar interests and goals. Although social network users often disclose more about themselves online than they do in person, there might be a risk for adolescents and for sensitive individuals, who can be negatively influenced by an incorrect use. However, although some studies show an increased risk of depression, other observations suggest beneficial effects of social networks by enhancing communication, social connection and self-esteem.

Keywords

bronchial hyperreactivity, Facebook-induced asthma, psychological triggers of asthma, social networks and psychophysical health, stress and asthma

INTRODUCTION

An increasing part of the two billion people on the Internet are connected with a social network [<http://www.internetworldstats.com> (Accessed 10 August 2012)]. Facebook users were more than 800 million, still increasing by almost 30% since the beginning of 2011 (<http://www.internetworldstats.com>), and Twitter recently surpassed 500 million users [<http://www.twitter.com> (Accessed 10 August 2012)]. Sixty-five percent of online adults use social networking sites and the figure reaches 83% when users aged 18–29 years are considered [1].

The number of people connected to social networks on a daily basis and their social and psychological consequences pose new challenges for healthcare providers. On the one hand, social networks might provide an invaluable tool for the management of patients, particularly those affected by chronic diseases; on the other hand, they raised concerns about the possible effects on physical and/or psychological health. It is worth mentioning that

use of social media is among the most common activities of today's children and adolescents. Thus, a large part of this generation's social and emotional development is occurring while on the Internet.

As use of social networks has been introduced only recently, few studies have been published on both the beneficial effects and potential risk for psychophysical health, and especially focused on adolescent and young adults, the population mostly

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KEY POINTS

- Recent studies showed that social networks are a promising tool in asthma management plans.
- Overuse of social networks might trigger symptoms in asthmatics prone to or affected by psychological disorders (mainly depression).
- Although still scarce, existing literature suggests social network misuse to be included among the potential sources of stress in teenagers and young adults.

being 'exposed' to this new type of virtual relationship. In some countries, various associations of healthcare professionals are starting to issue codes of conduct when dealing with new digital media [2–4], and discussion is still on going in medical journals [5–7].

As mentioned above, young adults are the biggest users of social media and even the population most affected by asthma. In fact, asthma is one of the most common noncommunicable diseases in childhood in many countries [8,9]. In 2004, the estimated cost of asthma symptoms among children in the European Union was 3000 million euros, not to mention absences from school and limitations in activities, indicating that asthma in children is a substantial disease burden for society [10].

The increase in asthma prevalence in developed countries seen at the end of last century has raised concern for the considerable burden of this disease on society as well as individuals.

In this context, use of social media in the management of asthmatic patients (especially in young adults) as well as its potential negative effects deserve more attention among doctors and health providers.

PSYCHOLOGICAL AND SOCIAL EFFECTS OF SOCIAL NETWORKS

Social-networking sites provide new access to the self, new chances to define one's identity and to develop new kinds of relationships. Photos, personal details and comments provide multiple opportunities for selective self-presentation, shedding new light on previously understood psychological processes.

Adolescents report that they often disclose more about themselves on social networks than they do in person [11]. As an example, in the section 'status update' of their Facebook profiles, they describe current experience or emotion along with the date and time of disclosure.

Thus, social networks may have positive as well as negative and potentially pathological effects especially on mental health. Several studies suggest that use of social media in general might have a beneficial effect on children and adolescents by enhancing socialization and even technical skills [12]. Social networks offer multiple daily opportunities for connecting with friends and for sharing common interests. Recently, Facebook has been shown to be able to stimulate online socialization, thus supporting and enhancing 'social self-esteem', measured as perceptions of one's physical appearance, close relationships and romantic appeal, especially when users received positive feedback from Facebook friends [13]. Individuals with low self-esteem may improve their condition from the social opportunities provided by Facebook [14]. Especially, selective self-presentation, that is the possibility to decide which aspects of one's self (e.g. through pictures or personal information) to include in one's own profile, afforded by virtual world of social network sites, can have a positive influence on self-esteem [15].

Already over a decade ago, Internet use was thought to promote negative psychosocial well being, including depression and loneliness [16]. The increasing use of social networks might have amplified these effects in the last few years.

The kind of stressful events that can be found in social network users are not in general different in nature from those we find in face-to-face encounters. Being removed from friend lists (cyberostracism) or online aggression from others (cyberbullying) can be traumatic for adolescents. In an Irish study on teenagers using social networks, 10% male individuals and 12% female individuals experienced bullying online, whereas 27% reported inappropriate contact from others. In addition, 33% of them felt they accessed social networks too often, underlining the risk of overuse and addiction [17].

Also, as social network sites are designed to share information about the self with others, this information could increase the awareness of their own limitations, which would lower self-esteem. Movies and pictures posted in a personal profile are displayed only unemotionally, or sometimes they amplify the emotions linked to those images. So, the lack of a physical or visual contact hampers the perception of the reality, inducing false or unreal convictions and distorted emotions. Moreover, via social media, adolescents can come in contact with inappropriate content, don't understand online privacy issues and/or can be influenced by third-party advertising groups. Internet addiction and concurrent sleep deprivation [18] other than physical inactivity, which is associated with

an increased risk of obesity [19], have to be taken into consideration, too.

A new type of depression, called 'Facebook depression,' was recently identified in preteens and teens who spend a great part of their time on social media sites and experience intense relationships on the web [20,21]. So, they are at risk for social isolation and sometimes seek Internet sites for 'help' paradoxically, eventually finding promotion for substance abuse, unsafe sexual practices or aggressive or self-destructive behaviours [22]. A virtual life cannot replace the experience of being accepted by peers or the contact with them.

SOCIAL NETWORKS AS POTENTIAL SOURCE OF STRESS TRIGGERING ASTHMA

In 2010 we described the first case of asthma exacerbations possibly triggered by use of Facebook. In that case, a young boy experienced asthmatic symptoms when he was logged to the personal profile of his former girlfriend [23]. Although anecdotal, this case report raises new questions about social networks as a new source of psychological stress, representing a triggering factor for exacerbations in depressed asthmatic individuals. Therefore, social networks might be considered in the assessment of asthma exacerbations as a potential source of psychological stress.

Since the end of the 19th century, asthma is known to be a disease noteworthy for its vulnerability to stress and emotion-induced symptom intensification. In addition to the pathological cellular and molecular immune processes, evidence also suggests that psychological processes contribute to the regulation of airway inflammation and clinical expression of disease severity in asthma. Some immunoregulatory dysfunctions are even similar in allergic diseases and stressed population [24]. There is also good evidence that genes involved in the stress and inflammatory response may affect asthma expression [25].

An interaction between behavioural, neural, endocrine and immune processes, and of the correlation between psychological factors, the course of asthma and the outcomes of asthma treatment, has been recently proposed. Evidence is now available that psychological factors play an active role in the genesis of asthma [26].

It is generally acknowledged that psychological stress and mood and anxiety disorders are more common in asthmatic patients and appear to increase expression of asthma symptoms. [26,27]. However, the precise nature of the type of stress and of the neural pathways implicated in modulating

asthma symptoms is unknown. The correlation between psychological disorders and asthma can be explained by the various hypotheses, which are not mutually exclusive: asthma itself increases the risk of developing anxiety and depression; mood and anxiety disorders lead to a higher risk of developing asthma; and asthma, anxiety, and depression are linked by a common underlying pathway.

The mechanisms underlying the interplay between psychological factors and asthma are still to be clarified. A credited model focuses on the close correlation between emotional stress, the immune system and the hypothalamus–pituitary–adrenal axis. Recently, neurophenotypes for asthma were identified by neural reactivity of brain circuits known to be involved in processing emotional information, especially in the anterior insula [28]. Individuals with asthma who have a late phase response showed increased anterior insular reactivity to asthma-relevant psychological stimuli, that is asthma-related words, exhibit greater inflammatory signals in the lung and increased severity of disease. These findings might reflect a subset of asthmatic patients, most vulnerable to the development of psychopathology, thus possibly offering a new target for potential therapeutic intervention.

A further question concerns the type of psychological stressors involved in the pathogenesis and/or the kindling of asthma. Because 'stress' is a very broad concept that includes a wide variety of events (e.g. loss, abandonment, personal assault, etc.), ways of being involved (personal experience, witnessing, etc.) and subjective emotional reactions (e.g. helplessness, fear, horror, etc.), speaking of stress in general is nonspecific and may have little clinical utility. Recent findings illustrate that psychosocial stress may influence asthma morbidity through posttraumatic stress disorder, prenatal and postnatal maternal/caregiver stress, family and community violence and deprivation [29]. Stress events in the life are associated with a major risk of developing asthma: divorce or separation, a major increase in marital problems, severe illness in a family member and severe conflicts with a supervisor. The hypothesis possibly explaining this observation is that stressful life events may alter the psychological, immunological and endocrine systems via mechanisms, which are still largely unknown [30].

In this view, a 'virtual' emotional, not unlike a 'real-world', stress might trigger an asthma exacerbation, especially in an individual with poorly controlled asthma because of a concurrent depression state, as in the case we previously described [23]. Thus, in clinical practice, asthmatic patients should be accurately evaluated from a psychological point

of view, also taking into consideration virtual stresses, especially in young individuals. In-depth anamnesis of their habits, including social network frequentation, should be performed in analogy to what routinely happens for all sorts of behaviours and lifestyles, which may trigger asthma.

ROLE OF SOCIAL NETWORKS IN THE MANAGEMENT OF ASTHMA

Social networks are already showing possible beneficial effects, both for driving healthcare system reforms [31] and for improving patients' networking (<http://www.patientslikeme.com/>). Some studies showed the effectiveness of social networks for disseminating public health messages, like food safety [32], sexual health education [33] and public health programmes in general [34]. The use of social media resources has been recently proposed to support more effective self-management among adolescents at high risk for systemic anaphylaxis [35].

Care for asthma patients has shifted from physician-managed care to guided self-management in the last years. However, written self-management plans and symptoms diaries are hampered by false and retrospective entries and by patients' and doctors' reluctance. For these reasons, several studies have recently shown that a web-based self-management of asthma is well tolerated, feasible, as effective as 'classic' management and costs are similar [36,37]. In addition, the combination of a web-based programme and a telephone nurse management showed a significant increase in asthma control (but not in adherence to treatment) in a paediatric population in a randomized controlled trial [38].

Moreover, text messaging and social sites were the preferred way to get information in a survey among 145 adult asthmatic patients [39]. Interestingly, female participants were more prone than male participants in the use of electronic media for asthma care.

Social networks might provide a beneficial effect on social relations of youth with asthma. As they can feel different and isolated from their peers and classmates, use of social networks and other media (e-mail, messaging) was shown to be effective in reducing isolation and loneliness and in improving self-confidence [40].

CONCLUSION

The dramatic increase in social network use, especially among adolescents and young adults, is driving healthcare researchers and professionals into a deeper knowledge on the effects of this new media

on general population and on people affected by chronic diseases. At the moment, taken as a whole, negative effects of social networks, like those described for asthma, seem to be counterbalanced by the increasing evidence of a positive effect on self-esteem.

However, physicians, healthcare providers, scientific societies and medical associations should put this topic in their agenda and propose guidelines and rules on how to responsibly include new clinical strategies and technologies in the patients' assessment, management and in the dissemination of health-related information.

Further studies are necessary to identify the occurrence of a 'depressive-prone' asthma phenotype to suggest an adequate psychological treatment as integration of allergen avoidance, drugs and immunotherapy.

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Conflicts of interest

All authors declare that they have no conflict of interest and that the study has been carried out without any financial support.

REFERENCES AND RECOMMENDED READING

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- of special interest
- of outstanding interest

Additional references related to this topic can also be found in the Current World Literature section in this issue (p. 123).

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