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OPINION ARTICLE

Cult of the Body Beautiful: At What Cost?☆

Culto al cuerpo: ¿cuál es el precio de la belleza?

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Our modern society's obsession with physical perfection has given rise to a plethora of new cosmetic procedures and a growing demand for interventions related to the illusory quest for the perfect body. In a series of surveys answered in 1973 by readers of *Psychology Today*, 25% of women and 15% of men reported dissatisfaction with their bodies; by 1997, these figures had risen to 56% and 43%, respectively.[1] The chief difference between the sexes was that men wanted a more muscular physique while women wanted to be more slender.

According to the InfoAdex investment index, advertising related to beauty products and services occupied third place in terms of total billing volume in 2008, accounting for over 500 million Euros. This advertising, to which we are constantly subjected, displays sculpted, unreal bodies portrayed as a synonym for success, happiness, and even health. This sociocultural pressure, transmitted and fueled by the media and the advertising industry, is teaching the public that benefits derive from having the right image and the ''perfect body.'' And what is worse, people are blindly struggling to emulate the prototype to win the approval of their peers. In response to this situation, the new Spanish law on audiovisual media (Ley Audiovisual, B.O.E. 1-04-2010) includes the following provisions: ''at the time of day when the law imposes restrictions for the protection of minors, providers of audiovisual media services may not broadcast commercials promoting the cult of the body or the rejection of a particular self-image, such as those promoting weight loss products, cosmetic surgery, beauty treatments, or any advertisement suggesting that people may face social rejection because of their physical condition or achieve success because of their weight or appearance.''

Until relatively recently, women were the sole target of the cult of the body beautiful. However, in recent years the same kind of social pressure has been placed on men, who have started to adopt lifestyle changes and become more concerned with their physical appearance. The advertising industry has invented the new concept of metrosexuality to describe the kind of man who takes painstaking care of his appearance, irrespective of sexual orientation. The male body is increasingly being used to advertise products that bear little or no relation to it, and male models have enhanced both muscle definition and the size of their genitals.[2] This sociocultural ideal of the young, handsome, and very muscular male may be as dangerous for men as the anorexic ideal is for women.

The diseases related to the cult of the body take different forms, some of them remarkably different from one another. The epidemic encompasses eating disorders such as anorexia nervosa and bulimia nervosa, but also includes bigorexia (also known as muscular dysmorphia or the Adonis complex), an obsession with bodybuilding, and tanorexia, an obsession with maintaining a year-round suntan. While very different, most of these disorders share a common symptom: the individuals affected are fixated on a body image

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they see as perfect and have a distorted perception of reality when they look in the mirror. This emerging epidemic has not yet been officially recognized by the World Health Organization as such, although some individual body dysmorphic disorders have been recognized (anorexia and bulimia). These disorders are extreme examples of the harm caused by the new canon of beauty, but we routinely encounter less radical attitudes and habits which, while not likely to have such devastating physical or psychological consequences, may represent health risks.

The modern culture of sun worship has instilled in people the notion that a bronzed skin is healthy and attractive. Individuals with tanorexia are obsessed with maintaining a year-round tan through excessive sunbathing or other means, including UV tanning booths and illegally distributed drugs, such as synthetic melanocortin analogs. Several studies have likened tanorexia to other addictive disorders, such as alcoholism and smoking, because of the pleasurable effect triggered by the release of endogenous opioids induced by exposure to UV rays.[3,4] Some authors have even reported withdrawal-like symptoms in frequent tanners after administration of naltrexone.[5]

Many of the most fervent followers of this fashion argue that increased exposure to sunlight stimulates vitamin D synthesis. They go on to point to the many articles in the medical literature linking vitamin D deficiency with numerous diseases beyond osteoporosis—including internal cancers and multiple sclerosis. There are still a great many controversial issues surrounding vitamin D in medical debates, but current evidence does not support recommending greater exposure to sunlight to increase the synthesis of vitamin D.[6] Limited exposure to sunlight together with a proper diet and oral vitamin D supplementation would appear to be a more reasonable and safer option for individuals at risk for vitamin D deficiency.[7] Apart from the obvious and proven risk of photocarcinogenesis, excessive exposure to sunlight is associated with many other undesirable consequences: photodermatoses, drug-induced phototoxicity or photoallergy, induction or exacerbation of systemic and cutaneous diseases, cataracts, premature photoaging, and photoimmunosuppression.

The available evidence supports a causal relationship between the use of tanning lamps and the development of nonmelanoma skin cancer and malignant melanoma. In 2009, the International Agency for Research on Cancer (IARC) classified UV radiation from tanning devices as carcinogenic to humans[8] based on the findings of a metaanalysis that reported a relative risk of 1.75 (95% CI, 1.35-2.26) for malignant melanoma when exposure occurred before 35 years of age.[9] Nonmelanoma skin cancer risk also rises: the same study showed that users of tanning booths had a relative risk of developing squamous cell carcinoma of 2.25 (95% CI, 1.08-4.70).[9] Despite this evidence, several studies have shown that, while people are now more aware of the harmful effects of UV radiation from both natural and artificial sources, they have not altered their behavior in relation to tanning.[9,10]

In recent years, this obsession with a year-round tan has led to increased use in the general population of 2 synthetic melanocortin analogs, melanotan I and melanotan II.[11] These drugs stimulate melanogenesis by increasing eumelanin production through interaction with the melanocortin 1 receptor (MC1R). If this were not enough, melanotan II also increases libido and induces erection, side effects that may not be considered undesirable by the consumers of these drugs. Melanocortin analogs are being investigated in phase III clinical trials for the treatment of erythropoietic protoporphyria and polymorphous light eruption because of their photoprotective effects, but they are already readily available through online shops, gyms, and tanning establishments. There is even an online user community (www.melanotan.org) with over 5000 members that hosts discussions on news items relating to melanotan, personal experiences, and dosage recommendations. The users of this website themselves and several scientific publications have warned about the probable causal relationship between melanotan use and both eruptive atypical melanocytic nevi and dysplastic changes in existing nevi.[12–14] Since only 2 cases of malignant melanoma have so far been reported in melanotan users, there is insufficient evidence to draw conclusions.[15,16] The use of these and other illegal drugs is also associated with other problems, including the dubious quality of the preparations sold and the risks associated with subcutaneous administration. For all of these reasons, the responsible agencies in the USA and numerous European countries have already issued warnings about the dangers associated with the illegal use of these drugs.

Other consequences of this obsessive pursuit of an idealized hypermuscular beauty include the sustained use of ergogenic substances such as anabolic steroids (AS), intensive training to achieve muscle hypertrophy, and significant changes in diet. Obsessive body building mainly affects males and may lead to a disorder known as bigorexia, or muscle dysmorphia. This condition has not yet been recognized as a disease by the international medical community, but it is often classed as a body dysmorphic disorder. Like anorexics, patients with bigorexia have a distorted perception of their own physique, but with an inverse result—they perceive their bodies to be too small. This new disorder gives rise to an obsessive desire to build muscle mass and consequently to a compulsive need to exercise excessively. Affected individuals neglect friends, family, and partners owing to their fixation on training, diet, and the care of their bodies. At the same time, their inability to see their own bodies objectively gives rise to perpetual dissatisfaction.

The fact that a person wants to improve their physical image or be more physically attractive does not mean that they have bigorexia, but it does increase their chances of developing the disorder. Nor should bigorexia be confused with the regular practice of a sport, since regular sports activity provides health benefits and is not associated with any risk of developing bigorexia. Individuals with this disorder have a tendency to consume ergogenic products, a large category of nutritional supplements and drugs that has become a very profitable business. There is no evidence to support the use of most of these products, and they are not approved for use by healthy people. Access to these products is easy, however, as they are available in gyms, stores specializing in sports supplements, and online outlets. As a result, they are generally taken by people without medical training or knowledge and without supervision by trained personnel. It is estimated that at least 3% of young adults in Western countries have taken AS products at least once.[17] In a student survey carried out in 2006 in the

Spanish Autonomous Community of Valencia by an organization that works to prevent drug addiction and provide help to addicts (Fundación para la Prevención y Asistencia a las Drogodependencias), 3.3% of respondents between 14 and 18 years of age admitted having taken an AS to improve their physique. Thus, contrary to what might seem to be the case, most current users of AS are not professional athletes or bodybuilders, but people whose sole aim is to enhance their physical appearance.[18] There are different levels of strength training and not all body builders, by any means, use AS products. However, clinicians should be aware that it can be easy—when certain personal risk factors coincide with a lack of information and easy access to these substances—for people to start using these products and then move from use to abuse. Ultimately these individuals can develop severe disorders, such as bigorexia.

ASs are usually administered orally or by intramuscular injection, the latter being the preferred route because it minimizes the toxic effects of the drug on the liver. Eighty-six percent of people who report using these products have also taken some other drug, either to obtain a synergistic effect or to mitigate one of the adverse effects of the AS.[19] In this way, the quest for the perfect body has created an entire arsenal of new drugs: recombinant human growth hormone (hGH) and insulin to increase muscle mass; antiestrogens, such as tamoxifen and clomiphene, to prevent AS-induced gynecomastia; human chorionic gonadotropin to stimulate the testes after the withdrawal of AS; diuretics to reverse AS- and hGH-induced fluid retention; and clembuterol, ephedrine, and thyroid hormones as stimulants to raise the metabolic rate and induce lipolysis. Logically, healthy individuals expose themselves to the risk of adverse effects when they take these drugs, especially when they are supplied by people with no medical knowledge. The risk of adverse effects is further increased by the doubtful quality of black market preparations and the inappropriate parenteral administration technique some users adopt. Cases of blood borne infection caused by shared syringes or multiple dose vials have been reported; soft tissue infection at the injection site with or without subsequent hematogenous spread is also a known complication.[20–22] In addition to such problems, the use of these drugs is associated with a wide range of adverse effects. From the dermatological standpoint, ASs are the drugs that most often affect the skin. Acne, male pattern baldness, gynecomastia, and striae primarily affecting the axillary and deltopectoral regions are common among consumers of these substances.[19] Although ASs remain the drugs most widely used to increase muscle mass, other anabolic drugs are now entering the market. A significant newcomer is hGH, a substance increasingly used to promote muscle mass and also to delay or prevent aging.[23] Conscious of the fraudulent marketing of hGH, the Spanish Agency for Medicines and Health Products has already issued a warning concerning the risks inherent in the use of this substance in healthy individuals and has moved to regulate its distribution.[24]

The category of so-called nutritional supplements—products used not only by muscle building addicts but also by a relatively large percentage of the population who want to improve their health or physical appearance—includes a very wide range of different substances that are in some cases of very doubtful effectiveness. Popular products include whey protein isolates with or without carbohydrates, branched-chain amino acids (leucine, isoleucine, and valine), glutamine, creatine, antioxidants, caffeine, stimulants of GH secretion, (arginine, lysine, and ornithine), and the so-called fat burners, including L-carnitine and the amino acids choline, inositol, and methionine. When taken under medical supervision, some of these substances can be useful in enhancing performance in sports and sports training. However, the appropriateness of their use by the general population is more debatable. But, there is no doubt whatsoever that their sale and distribution is a lucrative business. Some of these supplements contain pharmacologically active ingredients that are labeled or marketed in a misleading manner.[25]

The use of herbal remedies for a variety of purposes is also popular. The following are just some examples of such use: ginseng (*Panax ginseng*) and guarana (*Paullinia cupana*) as stimulants; *Ginkgo biloba* as an antioxidant and to improve blood flow; green tea as a stimulant and diuretic; *Tribulus terrestris*, muira puama, catuaba, and *Dioscorea villosa* as stimulants of endogenous testosterone; St John's wort (*Hypericum perforatum*) as an antidepressant; and guggul to reduce cholesterol levels. Whether these herbal remedies provide any significant health benefits is still a matter of scientific debate, and the true incidence of the side effects associated with their use is unknown. Since these products are classified as dietary supplements, they are exempt from regulations governing standard drug preparations. Consequently, the potency of herbal medicines is highly variable, making it difficult to obtain accurate scientific data on their efficacy and safety. The use of these herbal products has been associated with a number of drug interactions: ginseng and ginkgo biloba may increase the risk of hemorrhage during surgery because they inhibit platelet aggregation; St John's wort, which induces the P450 cytochrome, can modify the action of certain drugs, such as opioids, that are used during anesthesia. A case of gynecomastia induced by *Tribulus terrestris* has been reported,[26] and we recently saw 2 similar cases in our department. For this reason, patients giving a medical history should always be asked whether they are taking any herbal products.

Anorexia nervosa is an eating disorder characterized by a distorted body self-perception and self-induced weight loss. Patients with anorexia truly believe they are overweight, and this belief compels them to lose weight using a variety of methods, primarily dietary restriction combined with laxatives and diuretics, induced vomiting, and excessive exercise. Bulimia nervosa is a syndrome characterized by alternating periods of dietary restriction and binge eating followed by self-induced vomiting and purging with laxatives and diuretics. These 2 eating disorders, which mainly affect females and are provoked by the high cultural value now placed on thinness, have become epidemic in recent years. The obsession with being thin tends to become a nightmare during adolescence because young people whose personality and identity are not yet formed are subjected to a media barrage of models of perfection and beauty. As a result, they feel obliged to be as thin as the top models they see daily, even sacrificing their health by resorting to inappropriate behavior. Hundreds of web pages encourage anorexia and bulimia, and it has recently has been reported that pro ana (anorexia) and pro mia (bulimia) messages are also

exchanged through social networks such as Twitter, where members share weight loss tips. The law provides no basis for shutting down these web sites because defending the anorexic lifestyle is not a crime in Spain.

Among young women, the risk of anorexia nervosa is between 0.5% and 1% and the risk of bulimia nervosa ranges from 2% to 5%; the estimated mortality rate for anorexia is between 4% and 10%. Such figures are an indication of the magnitude of the problem.[27] Bulimia and anorexia, particularly the latter, can compromise almost any organ. The cutaneous manifestations associated with these 2 disorders have been the subject of a number of clinical reviews because they are numerous and occur frequently in these patients.[28,29] The causes include malnutrition, self-induced vomiting, drug abuse, and associated psychiatric disorders. Malnutrition gives rise to many types of skin changes, including xerosis, lanugo-type body hair, telogen effluvium, carotenemia, acne, acrocyanosis, perniosis, Raynaud phenomenon, pruritus, purpura, striae distensae, angular cheilitis, nail dystrophy, and many others. Induced vomiting causes oral manifestations, such as erosion of tooth enamel (perimylolysis), and Russell's sign, a reactive hyperkeratosis on the knuckles of the dominant hand caused by repeated introduction of the hand into the mouth. The abuse of laxatives, diuretics, and appetite suppressants increases the frequency of drug reactions in these patients. Finally, the frequency of psychocutaneous diseases, such as neurotic excoriations, dermatitis artefacta, and trichotillomania, is also higher in this population owing to associated psychiatric morbidity.[30]

While not officially recognized in the diagnostic manuals of mental disorders, orthorexia nervosa is another eating disorder that has become quite common. Orthorexia involves an obsession with healthy eating; affected individuals are more concerned with the quality of the food they eat than with the pleasure of eating. In extreme cases, the obsession with a diet perceived to be healthy can lead to social isolation. Young women are most affected, frequently in imitation of famous actresses or models, who are often eccentric but influential. People suffering from orthorexia are not concerned about being overweight and do not have a distorted perception of their own physical state, rather they are fixated on healthy eating. And, we might well ask, what is wrong with eating a healthy diet? The problem is that patients with orthorexia carry their obsession with healthy eating to an extreme and only consume foods produced using organic farming methods. They reject all food grown using pesticides or herbicides and all food products that contain artificial substances, such as additives, preservatives, and dyes. Very often, patients with this disorder present nutritional deficiencies caused by their avoidance of certain types of food, such as fats or meat, which they fail to replace by others providing similar nutritional components.

The desperate quest to emulate the current canon of beauty leads both men and women to challenge their bodies and subject them to countless transformations. The possibilities are endless. They decorate their bodies with tattoos or piercings, eliminate wrinkles associated with facial expressions with botulinum toxin, add volume in certain areas using fillers, and resort to adipocyte lysis techniques to reshape their figures. Is there any harm in using these techniques? In the hands of qualified professionals who adhere to the most stringent quality and safety standards, these techniques are a perfectly valid option so long as they help us to correct defects that cause distress. However, we must keep in mind that all of these techniques entail risks, as evidenced by the growing number of studies of such risks published in recent years.

Tattoos and piercings are increasingly used as a way to express an individual's identity or as a form of body art. The recent literature includes many systematic reviews and case reports that demonstrate a wide variety of adverse cutaneous effects.[31] Some of the most important ones are inflammatory reactions with varying histological patterns; skin diseases caused by bacterial, viral, or fungal infection; and skin tumors on tattooed areas. In view of the low number of reported cases of nonmelanoma skin cancer and malignant melanoma on tattoos and the high prevalence of tattooed people, pending more conclusive findings it would appear that this association is purely coincidental.[32]

Other techniques increasingly used to achieve a younger appearance include the injection of fillers to treat wrinkles and the augmentation of soft tissue. The ideal injectable material should do more than achieve the desired cosmetic result; it should be safe, biocompatible, remain stable at the site of implantation, give rise to minimal complications, and provide a long lasting effect.[33] Unfortunately, despite the wide range of possibilities, the ideal material has not yet been found. Consequently, we must always consider the possibility of adverse effects, especially when the procedure is performed by unqualified personnel.

The complications associated with the use of these materials for cosmetic purposes can be of different types.[33,34] A detailed discussion is beyond the scope of this article, but we will highlight a few examples. Immediate nonallergic reactions, such as pain, swelling, and bruising at the application site are common to the use of all of these materials; symptoms usually disappear without treatment within a few days. Irregularities and asymmetries may occur at the site of application owing to uneven application or superficial injection of the material. True type IV delayed hypersensitivity reactions appear in up to 3% of cases in which bovine collagen is used. Granulomatous reactions may occur months or years after implantation of the material, and the response to treatment of these reactions is usually poor. Complications related to the use of resorbable materials usually resolve spontaneously within a few months, while those associated with the use of nonresorbable materials generally cause permanent defects which in many cases can only be treated with surgical excision. Hyaluronic acid is the preferred facial filler because of its safety, versatility, and ease of application. Despite the widespread use of this substance, there are very few reports of hypersensitivity reactions to dermal fillers based on hyaluronic acid.

Adipocyte lysis procedures include a wide range of techniques that are used to destroy localized fat or cellulite. While the effectiveness of some of these procedures is, at the very least, questionable, they are nonetheless very popular. This category includes techniques involving the injection of various products into fatty tissue (hyposmolar solutions, CO_2, lipolytic products, and mesotherapy cocktails). Other methods rely on external physical agents (ultrasound, radiofrequency, infrared, or laser energy). The French Ministry of Health recently prohibited the use of

adipocyte lysis techniques by all medical professionals owing to the large number of severe complications that have been associated with their use, including the following: extensive bruising; non-infectious skin necrosis, often requiring surgical repair; and infectious processes, particularly outbreaks of atypical mycobacterial infections.[35] The same adverse effects have also been reported in other countries where these techniques are widely used. The reports particularly evidence the growing number of atypical mycobacterial disease outbreaks associated with mesotherapy.[36,37] The situation in Spain is similar, and outbreaks of atypical mycobacterial infection have already been reported in La Rioja (39 patients),[38] the Balearic Islands (17 patients),[39] and Catalonia (13 patients).[40]

In conclusion, the number of patients with disorders caused by excessive preoccupation with body image is reaching epidemic proportions. Before blindly pursuing a canon of beauty imposed as a social value, we should ask ourselves the following question: Is it worth putting our health at risk? Prevention is fundamental in this context. People must be taught from an early age to defend themselves against the cult of the body beautiful and obsession with bodily perfection. A sound education is the only way to combat misleading and dangerous advertising.

Conflicts of Interest

The authors declare that they have no conflicts of interests.

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