Culture, Psychosomatics and Substance Abuse: The Example of Body Image Drugs

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Patterns of illicit drug use vary widely around the world. For example, one recent survey [1] found lifetime cannabis use among 41.9% of respondents in New Zealand, but only 6.6% of respondents in Italy and 1.5% in Japan. Cocaine was reported by 16.2% of respondents in the USA, versus 4.1% in Spain and 0.0% in the People's Republic of China. Favored drugs of abuse may also rank differently within different countries. Japan, for instance, has experienced three major epidemics of methamphetamine abuse over the last 50 years [2, 3], but shows a low prevalence of many other forms of drug abuse that are widespread elsewhere [4]. Clearly, factors such as drug availability, government enforcement policies and national healthcare systems contribute to these figures, but one must also acknowledge the critical role of culture [5]. Culture influences not only attitudes towards illicit drug use in general, but also which particular drugs people choose to use; a drug effect sought by one population might have little appeal for another. As one example of this little-studied issue, we explore here a form of drug abuse that is strikingly asymmetric across cultures: the use of 'body image drugs' such as anabolic-androgenic steroids (AAS).

The AAS are a family of hormones that includes the natural male hormone testosterone and its numerous

synthetic derivatives [6]. In high doses, AAS permit users (who are mostly [7], though not always [8], male) to achieve marked increases in muscularity and decreases in body fat, often well beyond the limits attainable by natural means [9] (fig. 1). Prior to about 1980, AAS use was primarily confined to elite competitive athletes, but in the last 30 years, these drugs have spread into the general population [10]. Now, AAS have been used worldwide by millions of men, many of whom have no athletic aspirations, but simply want to look more muscular [6, 11]. Such men often also use various other body image drugs to gain muscle or lose body fat [12], including substances such as human growth hormone, thyroid hormones, insulin, clenbuterol and ephedrine [13, 14]. At present, however, most of the available epidemiological data are confined to AAS. Concern about the dangers of these drugs has mounted over the last decade [10], with increasing recognition of their possible cardiac [13, 15], neuroendocrine [6] and psychiatric effects [16], including the frequent development of dependence syndromes [17–19].

The prevalence of AAS use shows striking geographic variation. AAS abuse is a particularly common problem in Scandinavia [20–23], followed perhaps next by the USA [24, 25], then the British Commonwealth countries [26–30], Brazil [31] and the rest of Western Europe [32–

Fig. 1. a Photograph of Eugene Sandow, a famous bodybuilder from the era prior to AAS, showing the approximate maximum muscularity attainable without AAS. http://commons.wikimedia.org/wiki/File:Eugene_Sandow.jpg (accessed June 12, 2011). **b** A modern bodybuilder who has extensively used AAS.

Fig. 2. Drawing of the Farnese statue of Hercules from Bernardino Genga's *Anatomia per uso et intelligenza del disegno* (Rome, Domenico de Rossi, 1691). United States National Library of Medicine, Bethesda, Md., USA. From *Historical Anatomies on the Web*, plate 40. http://www.nlm.nih.gov/exhibition/historicalanatomies/Images/1200_pixels/genga_40.jpg (accessed June 12, 2011).

34]. By contrast, AAS abuse is rare in the Far East, with only a handful of reports of illicit AAS use in countries such as China, Korea or Japan [35–38]. Indeed, in a recent study where we administered questionnaires to 118 Chinese men aged 21–38 years at a Beijing graduate school [39], none reported having ever used AAS or having even

known of an acquaintance who had, even though AAS are legally available over the counter in Beijing pharmacies. Contrast this finding with Norway, where AAS are illegal, yet 28% of teenage students in one study knew an acquaintance who had used these drugs [21]. Admittedly, part of this difference reflects the lower overall ambient levels of substance abuse in the Far East. But this explanation alone is insufficient because other types of illicit drug use are well documented there: opioids in China [40], methamphetamine, cannabis and opioids in Korea [41], or methamphetamine and inhalants in Japan [3]. Why then are AAS almost completely restricted to the West?

We suggest that the explanation dates back millennia and is grounded in psychosomatics. Western cultures have extolled muscularity since ancient times, as illustrated by Samson in the Bible, or by the supernaturally muscular gods of ancient Greece and Rome. Consider for example the ancient Farnese statue of Hercules, now at the Museo Archeologico Nazionale Napoli (http://www.marketplace.it/museo.nazionale/emuseo_home.htm) and depicted in a 17th-century drawing by famed Italian anatomist Bernardino Genga (fig. 2). Working centuries before AAS were discovered, Genga had never seen a real man who looked remotely like Hercules, yet his drawing eerily anticipates the modern AAS-using bodybuilder in figure 1b. The mythic traditions of Scandinavia – the region with perhaps the greatest contemporary epidemic of AAS use – arguably place an even stronger emphasis on muscularity, as exemplified by the gods of Norse mythology. Look, for example, at Füssli's 1788 painting of Thor battering the Midgard Serpent (fig. 3), based on the story in the medieval *Prose Edda* [42]. Like Genga, working long before the AAS era, Füssli had never seen an actual

Fig. 3. Johann Heinrich Füssli's *Der Kampf des Thor mit der Schlange des Midgard* (Holland, 1788). Royal Academy of Arts, London, UK. http://en.wikipedia.org/wiki/File:Johann_Heinrich_F%C3%BCssli_011.jpg (accessed June 12, 2011).

Fig. 4. Eitaku Kobayashi's *Izanagi and Izanami* (Japan, 1885). Museum of Fine Arts, Boston, Mass., USA. http://commons.wikimedia.org/wiki/File:Kobayashi_Izanami_and_izanagi.jpg (accessed June 12, 2011).

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man who approached the proportions of the image that he painted – yet both Thor and his boatman Hymir, prone in the bow of the boat, look like AAS-using championship bodybuilders. These same venerable Western traditions of muscularity have continued to flourish into modern times, as illustrated by muscular action toys for children [43], male bodies in magazine advertisements [44], Hollywood movie characters [45] and numerous other images.

By contrast, the cultural legacy of the Far East is almost devoid of these traditions or images. Compare, for example, the deity Izanagi (fig. 4), who with his sister Izanami created the islands of Japan in the *Kojiki* epic [46], or Japan's oldest known sculpture of Buddha, constructed in the year 609, at the Asuka-dera in Asuka (fig. 5). These deities are fully clothed, with no suggestion of enhanced muscularity. Similarly, in modern-day China or Japan, one rarely sees images of muscularity. The hero of an Asian action movie may be a lean martial artist, but not a muscle-bound hunk like Hollywood's Conan the Barbarian. These Eastern cultural traditions, like

those of the West, hark back to ancient times. For example, as we have detailed elsewhere [47], the highly influential *Analects* of Confucius [48], written more than 2,000 years ago, link masculinity to intellect, refinement and virtuousness, but not to brawn.

The effects of these contrasting traditions are illustrated by the findings of recent studies using a computerized test of body image where college-age men were asked to select the male body that they thought was most appealing to women in their respective cultures. In response to this question, men in the USA, Austria and France selected a male image with about 10 kg more muscle than an average man in their societies [49], whereas men in Taiwan chose an image with very little added muscle, correctly recognizing that women were not attracted to a highly muscular male body [47] (fig. 6). This difference between East and West showed a striking effect size (Cohen's $d = 0.9$) [50], and it becomes even more impressive when one considers that many other types of body image concerns, by contrast, easily span cultural boundaries [51, 52]. In fact, young Japanese men actually appear to show higher levels

Fig. 5. Kuratsukuri-no-Tori's statue of Buddha at the Asuka-dera in Asuka, Japan (609 A.D.). http://en.wikipedia.org/wiki/File:Asuka_dera_daibutsu.jpg (accessed July 8, 2011).

of overall body dissatisfaction than their counterparts elsewhere [53, 54], even though they do not seem particularly dissatisfied with their muscles [55].

Will body image drugs such as AAS eventually infiltrate the Far East? That will depend on whether Western attitudes towards muscularity, augmented by the forces of media and marketing, can trump the equally venerable opposing attitudes in Asia. Confucian traditions remain strong in East Asia [47], and we doubt that they will easily be overturned by the influences of Hollywood. Similarly, Eastern traditions of self-cultivation [56] such as Japanese *shugyō* – ‘forging the spirit’ through lengthy mental and physical training – may militate against the ‘easy’ path of simply taking a drug to alter one’s body. Indeed, the very notion of merely enhancing the body while neglecting training of the mind or spirit is incompatible with longstanding traditions such as the *bushi* way in Japanese martial arts [57].

Nevertheless, looking at the somewhat analogous case of eating disorders, where body image concerns are in many ways the obverse of concerns about muscularity [58], we see that these disorders have begun to appear among men in Japan [59, 60] and China [61, 62], albeit more recently and less commonly than among men in Europe and America [63]. Clearly, cultural attitudes to-

Fig. 6. Discrepancy between the perceived muscularity of an ‘average man’ versus the muscularity of ‘the male body that women prefer the most’, as rated by men in the USA, France, Austria and Taiwan. Figure adapted, with permission, from Yang et al. [47].

wards the body image are not static, and shifting global trends may well alter the distribution of body image drugs in future decades.

What about other forms of drug use? Unlike the body image drugs discussed in our example above, most other drugs of abuse are sought for their acute intoxicating effect, or ‘high’, and for millennia, cultures have helped to dictate peoples’ preferred intoxicant. In 430 B.C., for example, Herodotus documented the practice of the Persians to consider affairs of weight while drunk on alcohol; if they first made a decision while sober, they would later deliberately reconsider it under the influence of wine [64]. Conversely, many deeply spiritual traditional societies have long valued hallucinogenic plants – peyote, psilocybin mushrooms, ayahuasca or iboga – for their entheogenic effects [65–67]. One might speculate about countless other possible cultural influences. Perhaps achievement-oriented East Asians value the mentally ‘sharp’ high of methamphetamine more than, say, the mentally ‘dull’ high of cannabis [68]. Perhaps societies with high levels of anxiety breed more sedative-hypnotic drug abuse than societies without. Importantly, in any such comparison, one must also take into account possible cultural differences in willingness to disclose substance use [69]. All these issues remain little studied.

And what about new drugs on the horizon? Progress in pharmacology will likely yield not only new intoxicants, but also cognitive enhancers [70], drugs that may someday allow individuals to ‘dial’ their own body weight [71], and other substances with a variety of psychosomatic properties [72]. These and other drugs will increasingly be diffused on the Internet, with the consequent tendency towards a globalization of cultures [13, 73–75].

How, in the brave new world of expanding pharmacological options and growing electronic access, will people in different cultures choose from the menu available to them? These issues, and indeed many elements of our above discussion, remain speculative. Clearly, however, the interface between culture and drug abuse will remain a fertile area for future exploration, with implications for public health, international policy and ethics [76].

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