Revisiting the Diagnostic Criteria for Muscle Dysmorphia

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SUMMARY
MUSCLE DYSMORPHIA (MD) IS A PSYCHIATRIC CONDITION CHARACTERIZED BY THE EXTREME PURSUIT OF MUSCULARITY AND SIMULTANEOUS REDUCTION IN BODY FAT. ALTHOUGH CURRENT DIAGNOSTIC CRITERIA EFFECTIVELY ILLUSTRATE THE BEHAVIORS INVOLVED IN THE PURSUIT OF GREATER LEAN MUSCULARITY, CLINICAL UTILITY IS LIMITED BY THE LACK OF A CLEAR DELINEATION CONCERNING THE DEGREE TO WHICH THESE CHARACTERISTICS ARE PRESENT IN PATHOLOGICAL PRESENTATIONS. THIS ALLOWS FOR CONSIDERABLE VARIATION IN THE POTENTIAL SCOPE OF THOSE DIAGNOSED WITH MD, AND THE POSSIBLE INCLUSION OF NONPATHOLOGICAL MUSCLE-BUILDING ENDEAVORS. THE PURPOSE OF THIS ARTICLE IS TO REVIEW THE EFFICACY OF DISTINGUISHING BETWEEN PATHOLOGICAL AND NONPATHOLOGICAL MUSCLE ENHANCING ENDEAVORS.

Under several circumstances, resistance training is regarded as a beneficial activity that typically brings about benefits in strength, muscularity, and overall health (8) in addition to increased positive self-esteem (10). The prescription of exercise as a therapeutic intervention has enjoyed a long history of clinical utility in a variety of psychiatric presentations (9,38).

However, when performed to excess, exercise may also form part of a constellation of pathological features associated with body image disorders (25). Traditionally, this association has been confined largely to the relationship between aerobic exercise and eating disorders in women, whereby women aspire to unattainable levels of thinness (12). However, research has illustrated a growing prevalence of body image dissatisfaction among men, which posits that both men and boys as young as 6 years reportedly desire a physique that differs markedly from their current perceptions of self (35).

Dissatisfaction in physique is a product of one's individual perception of what he or she looks like in comparison with a desired appearance (2). With men, this body image evaluation is most typically associated with muscularity and muscle tone (22) and a desire for greater lean body mass and muscularity (23). In an effort to achieve these desires, some men may adopt unhealthy strategies including extreme dieting, androgenic-anabolic steroid use, and excessive exercise programs. Such an extreme or pathological drive for muscularity may result in the development of muscle dysmorphia (MD) (24).

MUSCLE DYSMORPHIA
Most male gym users are realistic about their physical proportions and can exercise responsibly (34). Body image may be conceptualized along a continuum between no concern about one's physique and extreme concern. Men highly concerned with the attainment or maintenance of the leaner more muscular physique are vulnerable to the development of MD, a proposed psychiatric condition that is characterized by a preoccupation with the notion of being insufficiently muscular (31,35) and possess an excessive drive for lean muscularity (5).

Cognitive features of MD are characterized by a marked preoccupation with one's level of muscularity, often despite the presence of significantly developed musculature (31), demonstrating a level of body image distortion. Thoughts pertaining to a subjectively perceived lack of muscularity may be obsessive, which may persist for many hours per day and are typically associated with depressive and anxiety-related affective states (35). Clinical depression, anxiety disorders, self harm and suicides are also possible (36).

MD may also impact an individual's social and work life. Extreme concern about diet and a strict weight training regimen can affect relationships and work effectiveness (11,28,35). Failure to adhere to such rigid exercise and

KEY WORDS:
muscle dysmorphia; male body image; drive for muscularity; diagnostic criteria
dietary regimens typically results in feelings of intense anxiety and guilt, and immediate attempts to compensate (21). Further behavioral features include appearance enhancing substance use (often including anabolic-androgenic steroid), elaborate body checking behaviors, and/or an avoidance of bodily exposure (35). An overview of diagnostic criteria has tentatively been proposed (34,21) which include:

a. Preoccupation with the idea that one’s body is not sufficiently lean and muscular. Characteristic associated behaviors include long hours of lifting weights and excessive attention to diet.

b. The preoccupation is manifested by at least 2 of the following 4 criteria:
1. The individual frequently gives up other aspects of appearance as in other forms of body dysmorphic disorder (BDD), characteristics associated with MD.
2. The individual avoids situations where his or her body is exposed to others or endures such situations only with marked distress or intense anxiety.
3. The preoccupation about the inadequacy of body size or musculature causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.
4. The individual continues to work out, diet, or use ergogenic substances despite knowledge of adverse physical or psychological consequences.

b. The primary focus of the preoccupation and behaviors is on being too small or inadequately muscular, as distinguished from fear of being fat as in anorexia nervosa, or a primary preoccupation only with other aspects of appearance as in other forms of body dysmorphic disorder (BDD).

The Table provides some practical ways in which coaches and other health professionals such as strength and conditioning specialists might be able to identify individuals exhibiting characteristics associated with MD.

### DIAGNOSTIC DILEMMA

Given the preliminary nature of research indexing MD and the proposed diagnostic criteria, MD has yet to be formally recognized as a distinct clinical entity in diagnostic manuals (6,19), and as such, individuals cannot be formally diagnosed. This diagnostic uncertainty is compounded by the large degree of symptomatic overlap between MD and several other psychiatric conditions such as BDD, obsessive compulsive disorder, and eating disorders. Therefore, a more precise understanding of MD is needed (33), specifically in consideration of the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV-TR) categories and diagnoses that it closely resembles (2). Maida and Armstrong (19) suggest that MD ought to be conceptualized with disorders on the obsessive compulsive disorder continuum, rather than within the somatoform disorder classification. This is in contrast to others who consider MD as a form, subset, or subtype of BDD (13,18).

Recently, it has been suggested that MD may best be conceptualized as an eating disorder phenotype (26,30), noting that the obsessive compulsive features noted in presentations of MD parallel the obsessive compulsive features in presentations of anorexia nervosa (29). In addition, emerging research suggests that MD is inclusive of central eating and exercise-related practices.

### Table

**Muscle dysmorphia characteristics and their possible indicators**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Indicators</th>
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</thead>
<tbody>
<tr>
<td>Physique protection</td>
<td>An individual may wear tight clothing or baggy clothing even in hot environments. Embarrassment will be evident when required to reveal their physique (e.g., changing clothes)</td>
</tr>
<tr>
<td>Work Out Priority</td>
<td>Work outs will aim to increase muscle mass over other instructions or goals that focus on functional sport specific training. Note it is the intention of the exercise which is indicative of MD, not the outcome, and a focus on the chest, biceps and abdomen may be an indicator</td>
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<tr>
<td>Work out reductions</td>
<td>Physique may be more important than the weight training purpose. Tapering may be difficult because it may require a reduction in training weight and frequency, causing anxiety around potential loss of muscularity. Injuries and recommendations to reduce or stop weight training may be ignored</td>
</tr>
<tr>
<td>Priorities</td>
<td>An individual may place weight training above other areas such as work, study, and personal relationships. They may refuse to eat out or participate in an event if it might interfere with their diet or workout routine</td>
</tr>
<tr>
<td>Supplementation</td>
<td>The use of unhealthy supplements designed for fat loss or muscle gains that are not associated with improving sports performance is possible. Physical indicators of anabolic steroid use should be considered</td>
</tr>
<tr>
<td>Physical appraisal</td>
<td>An individual may frequently check their physique using reflective surfaces. They may ask others to comment on their physique. This typically constitutes reassurance-seeking behaviors around their belief of inadequate muscularity</td>
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such that eating practices alone exacerbate symptomatology (28), and that the exercise practices endorsed serve similar psychological and physiological functions to those reported in anorexia nervosa (27). Furthermore, a direct comparison of men with anorexia nervosa and MD revealed similar levels of shape and weight concerns, similar levels of restrained eating, and similar features of compulsive exercise, suggesting that both disorders are equally characterized by shape and weight concerns that are mediated by the manipulation of dietary and exercise-related practices (30).

The current nosological framework that accommodates MD as a form of BDD is particularly noteworthy in light of the DSM-IV diagnostic criteria for BDD, which stipulates that a perceived flaw in appearance can be real or imagined (1). That is to say, a person’s preoccupation with a missshapen nose may be due to either a perceptual disturbance of a regular nose or an excessive reaction to an actual irregularity in the nose. This distinction has important ramifications in the case of MD, as under the current diagnostic criteria, a person’s physical proportions may range from a very high to a low degree of muscularity. This variability has yet to receive theoretical or empirical attention, and conceptualizing MD as a BDD (without an emphasis on one’s current level of muscularity) may be fraught with difficulties (6). Most centrally, it begs the question of whether there is sufficient diagnostic scope to differentiate between dedicated muscle building behaviors (with the attendant health-related benefits) and MD, given that the underlying motivation and behavioral indicators for both may be similar (6). Certainly, if body dissatisfaction and feelings of inadequacy concerning body size are so frequently reported among men, declaring them central to a mental illness may stretch credulity.

**MUSCULARITY CONCERNS AND LEVELS OF MUSCULARITY**

Body image distortion, which refers to a perceptual disturbance in how one’s body is subjectively experienced, has been recognized as a crucial component of body image disorders for approximately 50 years (4). However, under the current diagnostic criteria, a person of low weight who pursues increased muscularity could be diagnosed with MD—providing that this pursuit results in high levels of shame and distress, avoidance of body exposure, and engaging in muscularity enhancing pursuits despite negative psychological and medical consequences (13,32). This is largely incongruent with a recent model of MD etiology, which stipulates that its development depends on a distortion of body size similar to what is commonly observed in anorexia nervosa, and more specifically that “body mass is the one criterion by which a diagnosis of MD can be made, much in the same way body weight is one of the diagnostic criteria for anorexia nervosa” (13, p. 68).

The current diagnostic criteria, while effective in drawing attention to behaviors undertaken to increase muscularity and disguise one’s (perceived or actual) “flaws” in muscularity, do not refer to the individual’s current level of muscularity. Indeed, there is little theoretical or empirical work to indicate whether a relentless pursuit of muscularity constitutes a different clinical profile if the person undertaking these behaviors is highly muscular, of average muscularity, or below average muscularity (34).

Although Pope et al. (34) suggested research criteria for MD, these criteria are inherently subjective. For example, it is the responsibility of the clinician to delineate between excessive versus nonexcessive attention to diet and weightlifting behavior, and to ascertain whether the individual exhibits a “preoccupation.” These criteria are based on limited clinical case studies, and how they apply to nonclinical settings has been questioned (17). In addition, these diagnostic criteria seem incongruent with empirically validated models of MD psychopathology (13), therefore questioning their clinical utility.

Although the currently proposed diagnostic criteria for MD make no reference to one’s current level of muscularity, the overarching diagnostic criteria for BDD do stipulate that only a “slight” defect in one’s appearance may be present (1). Thus, a slight defect in muscularity may exclude those with more than slightly underdeveloped musculature, although the point at which those with severely underdeveloped musculature are excluded from a diagnosis of MD remains unclear. The introduction of an anthropometric criterion may assist clinical practice in exactly where to draw this line and place an individual’s preoccupation in the context of their current level of muscularity, which is crucial in indexing body image psychopathology (4,13).

**RECOMMENDATIONS FOR A MUSCULARITY-BASED CRITERION**

Cafri and Thompson (5) have suggested 3 features necessary for male body image measures. First, the upper torso should be included if the scale focuses on specific body parts or areas of the body. Second, items that assess features indirectly related to body appearance such as eating and exercise behaviors should be related to muscularity. Third, the scale should evaluate a muscular appearance by including both muscularity and body fat measurements. Empirical research has advocated the use of equating the fat-free mass index (FFMI) ([FFMI in kg] ÷ [height in m] – 2) when indexing the individual’s level of muscularity (15,16). This index is preferred over the body mass index (BMI), as BMI may not be accurate for use in those with high levels of muscularity. Empirical research postulates that an FFMI greater than 25.0 exceeds naturally attained lean muscle, and a sustained level of muscular enhancing substance use is likely (35). Anabolic-androgenic steroid use in itself is a postulated correlate of MD (37), although this remains a topic of some debate (3). However, FFMI may help further delineate at which point on the body image continuum nonpathological bodily concerns develop into more pathological endeavors (7). Given that...
muscular dissatisfaction is common to both pathological and nonpathological gym-going men, establishing an anthropometric marker may likely aid clinicians in ascertaining the magnitude of body image distortion, a central feature of MD (13).

To date, no research has explicated whether there is a point at which a level of FFMI consistently correlates with clinical MD symptomatology. A case-control study found that those meeting diagnostic criteria for MD exhibited, on average, an FFMI of 25.2, whereas those not meeting the criteria exhibited an average of 22.9 (32). However, one study is insufficient to draw holistic conclusions. Incorporating a muscularity-based criterion in the diagnostic criteria for MD would likely allow for greater consistency in diagnoses because such a criterion would limit the possibility of clinicians imparting their own notion of what constitutes “significant muscularity,” allowing greater homogeneity in athletic and clinical research.

WEIGHING THE OPTIONS

The clinical utility of the current diagnostic criteria for MD has recently been questioned in light of the increasing knowledge base pertaining to MD which has emerged over the past 15 years. Perhaps these criteria should be revisited. The current diagnostic criteria do allow the clinician some leeway to consider cases individually and subjectively determine the extent of any muscularity preoccupation, although this clinician subjectivity may lead to varied interpretations in the absence of more stringent and clear guidelines.

Muscle dissatisfaction arises from incongruence between how an individual perceives themselves to look with respect to muscularity and leanness, in contrast to what they want to look like. We propose that a third component of muscle dissatisfaction be included, namely what an individual actually looks like with respect to their muscularity and leanness. Adding this component to the current diagnostic criteria will allow clinicians and diagnosticians to determine whether the individual is able to accurately perceive his or her own physique, thereby identifying body distortion, which is a central component of MD and body image psychopathology in men (13,14,20).

PRACTICAL APPLICATIONS FOR COACHES AND OTHER HEALTH PROFESSIONALS

Because MD is a condition that references the shame of one’s perceived muscularity, it can be difficult to identify and treat. Coaches within weight-lifting facilities, particularly those who specialize in strength and conditioning, are most likely to detect an individual exhibiting characteristics associated with MD. There are several things to look out for.

First, that person may prefer covering up their physique or will only reveal parts of their physique after meticulous preparation, which acts as a safety behavior for their anxiety around their perceived insufficient muscularity. For instance, avoiding tight clothing and wearing baggy sweats (even during the summer) are common examples, as are completing ‘quick pump-ups’ and attempting to temporarily engorge particular body parts with blood before displaying them. Further observable manifestations of this body shame may be detected through significant anxiety, embarrassment, or an avoidance of revealing one’s physique while changing.

Second, the individual may work out specifically to increase muscle mass rather than functional sport-specific training, even if not instructed to do so. Thus, the individual focuses on exercises and/or weight training that will build size or enhance the visible appearance of lean muscularity rather than function or some other performance-related goal. It should be noted that an individual’s knowledge of exercises and training techniques that will actually increase muscle mass does not mediate symptom severity. For example, in attempting to gain muscle mass, an individual may not possess adequate knowledge to do so effectively, and in this sense it is the intended purpose of the exercise that is indicative of MD, not the outcome. A frequent emphasis on aesthetic training as opposed to functional training, typically focussing the chest, biceps, and abdomen may be an indicator.

Third, the individual may value their physique over the weight training purpose. For example, tapering for a competitive event may be difficult for this individual because it may require a reduction in training weight and frequency, causing anxiety around potential loss of muscularity. Furthermore, individuals with features of MD typically find it incredibly difficult to temporarily desist from weight training if injured because of similar anxieties concerning loss of muscularity.

Fourth, placing weight training above other important areas of one’s life such as work, study, and personal relationships may be evident. An individual may make excuses for not eating out or refuse to participate in a social function fearing it may interrupt their diet or training schedule.

Fifth, the individual could be using supplements that are unhealthy, yet are intended to bring about enhanced muscularity. This should be differentiated from those using the supplements to improve sports performance. This can be difficult to identify, but common physical indicators of anabolic steroid use should be considered.

In addition, individuals affected with MD may demonstrate an increasing array of body checking behaviors, including reflective surface checking. Furthermore, individuals may display observable signs of anxiety around the loss of muscularity, which can include asking those close to them if they have gotten smaller, which typically constitutes reassurance-seeking behaviors around their belief of inadequate muscularity. Should an individual demonstrate some or all of these characteristics, there is the possibility that they may be demonstrating features of MD. However, it is important to note that a wide range of body image dissatisfaction exists among men, and this in itself may not be
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