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Understanding the Relationship between Low Muscle Mass and Depressed Mood in Korean Girls

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The article on the inverse association between muscle mass and depressed mood in Korean girls can be informative and interesting.[1] Most of all, it is remarkable that by fitting the binary logistic regression models, a significant relationship between low muscle mass and depressed mood was observed not in boys but in girls. Inconsistent with the findings of Moon et al.,[1] the reverse sex disparity pattern in the relationship between muscle mass and depressive symptoms was shown by the previous findings of a study that included 1,605 adults aged 40–80 years.[2] More specifically, an inverse association between lean muscle mass level and depressive symptom severity was reported not in women but in men. In addition, men, not women, showed an association between low skeletal muscle mass and depressive symptoms in a study that included in 1,151 men and 2,176 women aged 30–64 years in Korea.[3] Although the sex disparity in the association between muscle mass and depressed mood is still inconclusive, the discrepancies can be explained as follows: First, greater hypothalamic-pituitary-adrenal (HPA) axis stability was exhibited predominantly mainly by boys rather than by girls in adolescence but not in adulthood.[4] Thus, greater inflammation due to greater HPA axis reactivity was shown mainly by girls rather than by boys.[5] Second, depressive mood is not equivalent to depressive symptoms or depressive disorders but one of the diagnostic criteria of major depressive disorder (MDD). Besides depressed mood, vegetative symptoms, including weigh/appetite loss, insomnia, fatigue, and inattention, constitute the criteria for MDD.[6] Moreover, one study with 1,171 Asians with depressive disorders reported that fatigue and loss of interest were more prevalent in men than those in women, whereas suicidal ideations or acts were more prevalent in women than in men.[7] Thus, it can be speculated that in boys vegetative symptoms do not contribute to the association between muscle mass and depressed mood. Hence, more rigorous assessment scales for evaluating depressive symptoms are needed in further studies on the relationship between muscle mass and depressive symptoms. As the cause-and-effect relationship cannot be simply defined in terms of muscle mass and depressed mood, it is speculated that the relationship still remains a "chicken-and-egg" dilemma. Thus, the "common interrelated biological pathway," which has been suggested to explain the relationship between diabetes and depression,[8] can be applied to model an inverse association between muscle mass and depressed mood. In addition, HPA axis dysfunction, inflammatory process, circadian rhythm disruption, epigenetic alteration, and other biological mechanisms may be linked to decreased muscle mass and depressed mood in Korean girls.

Exercise has been known to increase the level of brain-derived neurotrophic factor, which is associated with increased hippocampal volume. Ultimately, exercise can contribute to the treatment of depression.[9] Hence, exercise has been recommended as the primary or secondary adjunctive treatment method for depressive disorders in the evidence-based non-pharmacological treatment guideline for depression in Korea[10] and other eminent international treatment guidelines for depressive disorders. In addition, one study showed that in patients with MDD, muscle mass was significantly increased after regular aerobic exercise intervention.[11] In summary, in terms of the "common interrelated biological pathway," exercise can have a therapeutic potential for not only depressed mood but also low muscle mass. Moreover, as the preventive effects of exercise on depressive disorders were proposed in the HUNT study (Health Study of Nord-Trøndelag Country) on the basis of an 11-year prospective survey of a healthy cohort of 33,908, exercise prescription by psychiatrists has been considered.[12,13] Furthermore, modeling the relationship between amount of exercise and risk of developing depression has been suitably fitted to the logarithmic function. The modeling may suggest that exercise has the greatest preventive effect on depression, on the condition that individuals who do not exercise initiate to exercise. In conclusion, on the basis of the findings of Moon et al.,[1] in terms of the public mental health of adolescents in Korea, it is suggested that exercise is required for girls who do not currently have an exercise habit.

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