Age-related changes and sex differences of androgen on skeletal muscle metabolism

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It has been suggested that the age-related decline in androgen is not only associated with frailty and the need for nursing care, but may also lead to the disruption of musculoskeletal relationships and metabolic disorders by inducing skeletal muscle mass loss, bone fragility, and metabolic disorders. On the other hand, the pathophysiology and gender differences in these processes remain unclear. In this study, we focused on androgen action in fast-twitch muscle, which is considered to be the main locus of sarcopenia, and used fast-twitch muscle-specific androgen receptor (AR)-deficient mice established by the applicant to investigate the pathogenesis of abnormal skeletal muscle metabolism, sarcopenia, and osteoporosis, as well as the common basis and sex differences in the onset and development of these disorders. We have also investigated the pathophysiological basis of these diseases using mice deficient in the fast-twitch muscle-specific AR. In the AR-deficient mice, muscle mass and strength loss, bone changes, and sex differences have been observed, and changes and differences in skeletal muscle metabolism have also been suggested through expiratory gas analysis and various comprehensive analyses.