LETTER TO THE EDITOR

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# Concern regarding quality and quality of muscle

Creatinine and myoglobin are poor predictors of anaerobic threshold in colorectal cancer and health. It certainly has been agreed upon that lean muscle mass (LMM) is essential in predicting aerobic performance of healthy and non-disseminated colorectal cancer (CRC) patients. It was confirmed that LMM is a powerful predictor of aerobic performance and mortality.[1,2] Additionally, there are some reports that creatinine and myoglobin were surrogates for muscle mass.[3,4] We believed this is a very important study and congratulate the authors for their innovative study. However, anaerobic threshold was significantly lower in the CRC patients compared with healthy controls, although there was no significant difference in serum creatinine, myoglobin, and LMM in this study. There is no significant correlation between serum creatinine or myoglobin and aerobic performance. I would like to address three issues to understanding of findings this study.

The first issue concerns the current hypothesis that myoglobin levels were affected by muscle mass and myoglobin-rich-type fibres. Therefore, myoglobin levels are usually reduced in cachexia patients associated with the muscle wasting and weight loss.[5] However, serum myoglobin level in CRC patients was within normal range, and CRC patients were also heavier than the controls in this study. Therefore, there is a possibility that non-disseminated CRC patients do not suffer from progressive cancer-related muscle wasting.[6] The authors also described that 'Results of this study might not extend to the sarcopenic and/or obese patient'.

We would like to point out the necessity of further studies to analyse the correlation between serum creatinine or myoglobin and aerobic performance in non-disseminated CRC patients with cachexia-related muscle wasting.

The second issue concerns the accepted notion that peak $VO_2$ is more sufficient maker of aerobic performance rather than anaerobic threshold (AT). The authors defined AT as indicator of aerobic performance, based on a pragmatic clinical decision. However, several reports used peak $VO_2$ as a pre-operative predictor of mortality or morbidity in cardiac and non-cardiac surgery, because peak $VO_2$ is reported the highest test–retest reliability in variable of cardiopulmonary exercise test.[7]

We would like to point out that peak $VO_2$ is seen as the more sufficient maker of aerobic performance. Actually, peak $VO_2$ has been used as biomarker of aerobic performance in a previous report that confirmed the relationship between myoglobin and muscle mass.[3]

The third issue concerns the current opinion that muscle strength/muscle power is also important as well as muscle mass. Recently, some researchers reported low muscle strength, as a maker of muscle quality, is more strongly associated with mortality than low muscle mass as a maker of muscle quantity.[8,9] Actually, aerobic performance is closely related to muscle strength/muscle power rather than muscle mass.

The relationship between muscle strength/muscle power and serum creatinine or myoglobin in non-disseminated CRC patients with cachexia-related muscle wasting is a very interesting field that needs to be studied further.

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