

Diffusion-weighted MRI Compared to CT of Exercise-induced Acute Renal Failure (ALPE)

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Acute renal failure with severe loin pain induced by anaerobic exercise (ALPE) is a rare condition, develops in young healthy males after repeated anaerobic exercise which an intense power output per second or per minute such as a short-distance sprint, soccer, a swimming race, baseball, weight lifting, and a bicycle race. It is accompanied by wedge-shaped contrast enhancement on computed tomography (CT) without evidence of rhabdomyolysis. Clinical characteristics of ALPE include reversible kidney dysfunction and temporary multiple wedge-shaped delayed enhancements visible on CT. The pathogenesis of ALPE is thus suspected to involve temporary patchy ischemia of the kidney resulting from reversible vasoconstriction of the renal vessels. Although contrast-enhanced CT is the gold standard for diagnosing ALPE, use of contrast media is potentially problematic for patients with renal dysfunction. On the other hand, the abnormal findings on diffusion-weighted magnetic resonance imaging (MRI) are known to suggest cytotoxic edema and/or vasogenic edema. In two adolescent cases with ALPE, we tried to determine the relationship between findings from CT and magnetic resonance imaging (MRI). Case 1 involved a 29-year-old male with a diagnosis of ALPE, and case 2 a 32-year-old male. A clear wedge-shaped signal hyperintensity matching the CT images was obtained by diffusion-weighted MRI. Here, we report the cases of two young patients with ALPE in whom temporary patchy ischemia could be identified by noninvasive diffusion-weighted MRI. In conclusion, diffusion-weighted MRI is a very useful examination for diagnosing ALPE, providing noninvasive detection of lesions peculiar to ALPE.

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