Cardiorespiratory capacity in children and adolescents on maintenance haemodialysis.

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Background: Paediatric patients on maintenance haemodialysis (HD) often report their own physical fitness to be hampered. Their physical endurance capacity is known to be significantly lower than that of healthy controls. However, physical endurance was up to now only examined on non-HD days. We were interested in the effect of HD on the cardiorespiratory capacity of children and adolescents on maintenance HD.

Methods: We therefore examined the endurance capacity by cardiopulmonary exercise testing on a cycle ergospirometer, before and after HD in 14 patients (9 male, 5 female; mean age: 15.1 ± 3.0 years; mean period on HD: 16.3 ± 11.5 months).

Results: The feasible time spent on the cycle ergospirometer was significantly reduced after dialysis (8.6 ± 3.2 versus 6.4 ± 2.5 min, P < 0.001), also the maximal workload was decreased (95 ± 36 W to 74 ± 29 W, P < 0.003). The starting and recovery heart rates were higher after than before dialysis. The peak oxygen uptake (VO(2) peak, VO(2) peak/kg) was reduced from 1.644 ± 600 to 1.422 ± 450 mL/min (P < 0.02) and from 35 ± 7 to 31 ± 5 mL/min/kg (P < 0.03), respectively. The respiratory exchange ratio as well as the lactate values showed significant differences in varied workload levels (P < 0.05).

Conclusion: Paediatric patients on maintenance HD in general have a significantly lower exercise capacity compared to a healthy age-matched population, which is expressed much more after dialysis.

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