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ORIGINAL ARTICLE

Impact of chronic kidney disease on quality of life, lung function, and functional capacity☆,☆☆

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KEYWORDS
Renal insufficiency, chronic;
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Abstract
Objectives: To evaluate the impact of the chronic kidney disease (CKD) on quality of life, from the children's and their parents' perspective, respiratory muscle strength, lung function, and functional capacity in children and adolescents.
Method: Cross-sectional study of children with CKD aged 8 to 17 years. Those incapable of taking the tests were excluded. After an interview, quality of life by Pediatric Quality of Life Inventory) (PedsQL™), muscular strength, pulmonary function tests, and the 6-minute walking test (6MWT) were applied. Student's *t*-test, ANOVA (difference in means), and Pearson's coefficient of correlation were used. The level of significance was set at 5%.
Results: Of the 40 patients, the mean distance walked at the 6MWT was 396 meters, and the mean final score at the quality of life test as perceived by the children and parents was 50.9 and 51, respectively. From the children's perspective, the transplanted patients had a higher quality of life score when compared to those undergoing hemodialysis ($p < 0.001$); those who practiced physical activity had better quality of life when compared to the sedentary children ($p < 0.001$). From the children's and the parents' perspectives, the male gender had a higher quality of life score ($p < 0.05$). There was a positive correlation between the distance walked at the 6MWT and age, height, final PedsQL™, forced vital capacity (FVC), and forced expiratory volume in the first second (FEV_1), as well as a negative correlation between FEV_1/FVC and the distance walked.
Conclusion: A significant reduction in the quality of life and the functional capacity was observed in children with CKD, influenced by the type of treatment, gender, and sedentary life style.

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PALAVRAS-CHAVE
Insuficiência renal crônica;
Criança;
Função pulmonar;
Qualidade de vida

Repercussão da doença renal crônica na qualidade de vida, função pulmonar e capacidade funcional

Resumo

Objetivos: Avaliar repercussões da doença renal crônica (DRC) sobre a qualidade de vida na percepção das crianças e dos pais, força muscular respiratória, função pulmonar e capacidade funcional em crianças e adolescentes.

Método: Estudo transversal de crianças e adolescentes com DRC de oito a 17 anos. Excluídas as incapazes de realizar os testes. Após entrevista, aplicou-se questionário de qualidade de vida (PedsQL™), testes de força muscular, função pulmonar e teste de caminhada de 6 minutos (TC6 min). Foi utilizado o teste *t* de Student e ANOVA (diferenças de médias) e o coeficiente de correlação de Pearson. Considerou-se nível de significância de 5%.

Resultados: Dentre os 40 pacientes, a média da distância percorrida no TC6 min foi de 396 ± 71 metros, e a média do escore final de qualidade de vida percebida pelas crianças e pelos pais de 50,9 e 51, respectivamente. Na percepção das crianças, os transplantados apresentaram maior escore de qualidade de vida, comparados aos em hemodiálise ($p < 0,001$), e aos com atividade física e melhor qualidade de vida, comparadas às sedentárias ($p < 0,001$). Na percepção das crianças e dos pais, o sexo masculino apresentou maior escore de qualidade de vida ($p < 0,05$). Houve correlação positiva entre a distância percorrida no TC6 min e as variáveis idade, altura, PedsQL™ final da criança, capacidade vital forçada (CVF) e volume expiratório forçado no primeiro segundo (VEF_1) e negativa entre VEF_1/CVF e a distância percorrida.

Conclusão: Observou-se redução significativa na qualidade de vida e na capacidade funcional em crianças com DRC influenciadas pelo tipo de tratamento, sexo e sedentarismo.

Introduction

Chronic renal failure (CRF) is characterized by slowly progressive, irreversible loss of kidney function.[1] In children, chronic kidney disease (CKD) is associated with significant cardiovascular morbidity and mortality, hospitalizations, and common specific problems, such as impaired growth and biopsychosocial changes that have an impact on quality of life (QoL).[2]

Data from the Brazilian Society of Nephrology in 2012 showed that 0.3% of children with CKD aged 1 to 12 years and 4.2% between 13 and 18 years undergo dialysis.[1] In recent years, the number of patients on dialysis has doubled, with an increase of 8% per year, increasing from 18,000 patients in 2001 to 91,314 in 2011, resulting in significant healthcare costs.[3]

Studies have shown that children and adolescents with CKD may have alterations in QoL, muscle strength, lung function, and functional capacity.[4,5]

The assessment of health-related QoL is an important criterion when evaluating the effectiveness of treatments and interventions in healthcare, making it important to understand the existing association between the disease and QoL.[6] Goldstein et al.,[7] in 2008, developed the PedsQL™ questionnaire to specifically assess QoL in children and adolescents with CKD. This questionnaire assesses seven domains (general fatigue, kidney disease, treatment, interaction with family and friends, worry, physical appearance, and communication), and is applied to patients with CKD and their parents or guardians. Studies on QoL using the PedsQL™ have verified the impact of CKD on QoL of children and adolescents.[7,8]

The PedsQL™ version 3.0 was translated and culturally adapted into Brazilian Portuguese in 2011,[9] but there are no published studies on its validation in Brazil.

The reduction in functional capacity and performance of physical and recreational activities can be influenced by physical deconditioning, muscle disuse atrophy, weakness, fatigue, lower-limb edema, and back pain, among others, hindering the performance of daily living activities by these children.[10,11] Other factors may impair the muscular system of CKD patients, such as decreased protein-calorie intake and protein imbalance. The respiratory muscles may show decreased strength and endurance properties due to uremic myopathy.[12–14]

Respiratory muscle strength measurement aids in the early identification of muscle weakness, as well as identification of the severity, functional consequences, and evolution of pulmonary and neuromuscular disorders.[15,16] A study has demonstrated that children and adolescents with CKD have significantly lower muscular strength values, when compared to healthy subjects.[4]

Walking tests are submaximal tests used in the assessment of functional capacity of children with physical exertion limitations. They are easy to perform, reproducible, low-cost, and show good correlation with the maximum oxygen consumption obtained at maximal exercise tests.[17–19] A study has demonstrated that children with CKD have lower functional capacity when compared to healthy children.[19]