

Pain determinants of pain in autosomal dominant polycystic kidney disease

Determinantes de dor em pacientes com doença renal policística autossômica dominante

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ABSTRACT

Pain is the most common symptom reported by ADPKD patients, afflicting approximately 60% of cases and may result from renal hemorrhage, calculi, urinary tract infections, cyst rupture, or due to stretching of the capsule or traction of the renal pedicle. We have recently investigated pain patterns in ADPKD patients using a translated version of a pain questionnaire specific for ADPKD population. The questionnaire revealed that 67% patients with ADPKD exhibited some type of pain. The findings of that study emphasized that pain appeared early in the course of ADPKD, when patients still exhibited preserved renal function. In the present study, a multivariate logistic regression analysis disclosed that renal volume (9-fold increased risk) and nephrolithiasis (4-fold increased risk) were the most important determinant factors for pain in ADPKD patients with preserved renal function, after adjustments for the presence of hypertension and duration of the disease.

Keywords: abdominal pain; lumbar pain; nephrolithiasis; polycystic kidney disease.

RESUMO

A dor é o sintoma mais comum relatado pelos pacientes com doença renal policística autossômica dominante (DRPAD), acometendo aproximadamente 60% dos casos, e podendo resultar de hemorragia renal, cálculos, infecções do trato urinário, ruptura do cisto, ou devido ao estiramento da cápsula ou à tração do pedículo renal. Recentemente, investigamos padrões de dor em pacientes com DRPAD usando uma versão traduzida de um questionário de dor específico para a população com DRPAD. O questionário revelou que 67% dos pacientes com DRPAD apresentaram algum tipo de dor. As conclusões do estudo enfatizaram que a dor apareceu no início do curso de ADPKD, quando os pacientes ainda exibiam função renal preservada. O presente estudo, através de uma análise de regressão múltipla, revelou que o volume renal (risco nove vezes maior) e a nefrolitíase (risco quatro vezes maior) foram os fatores determinantes mais importantes para a dor em pacientes com DRPAD com função renal preservada, após ajustes para a presença de hipertensão arterial e duração da doença.

Palavras-chave: doença renal policística; dor abdominal; dor lombar; nefrolitíase

Pain is the most common symptom reported by ADPKD patients, affecting approximately 60% of them,¹ related to renal hemorrhage, calculi, urinary tract infections, cyst rupture, or due to stretching of the capsule or traction of the renal pedicle.^{2,3} We have recently performed a translation and cultural adaptation⁴ of a pain questionnaire specific for ADPKD patients, validated in the US.¹ The application of this questionnaire in our population enabled us to detect some type of pain in 67% of ADPKD patients, more often

located in the low back (77%), abdomen (66%) and chest (4%), including headache (15%). After the family history, which led to the diagnosis of ADPKD in 55% of cases, the presence of low back (13% of cases) and abdominal pain (9% of cases) represented the most frequent complaints, further helping to establish the diagnosis. Although we had observed that patients with pain presented a significantly higher renal volume (detected by ultrasound through the ellipsoid formula)^{3,5} than those without pain, the deterioration of renal

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function and hypertension, as well as nephrolithiasis, could have possibly affected the relationship between pain and kidney enlargement in an important way, biasing such observations.^{3,5}

The present report aimed to investigate the most important determinant factors for pain among these ADPKD patients ($n = 97$, 64F/33M, 35 ± 12 years old), adjusting for all possible confounding factors. A stepwise multiple regression analysis preceded by a univariate analysis was used to estimate the odds ratio (OR) for the occurrence of pain in patients with ADPKD including categorical and numerical variables such as age, duration of the disease, association with hypertension, microscopic hematuria, nephrolithiasis, CKD (stages 1 or 2 versus 3), number of cysts, size of the largest cyst and renal volume. A receiver operator characteristic curve showed a cutoff value (380 mL) for a significant renal volume as a predictor of pain. As seen in Table 1, the multivariate logistic regression analysis (performed with the parameters left in the model) disclosed that a renal volume ≥ 380 mL (Odds Ratio, OR 8.99; 95% Confidence Interval, CI 2.59-31.20, $p < 0.001$) and the presence of nephrolithiasis (OR 4.10; 95% CI 1.17-14.35; $p = 0.027$) were independent risk factors for the occurrence of pain, adjusted for the presence of hypertension and duration of the disease. An additional multiple regression analysis performed on 82 patients categorized as CKD stages 1 or 2 (excluding 15 patients with CKD stage 5) showed an OR of 12.06 for a renal volume ≥ 380 mL (95% CI 3.10-46.96; $p < 0.001$) and of 7.25 for nephrolithiasis (95% CI 1.50-34.93; $p = 0.01$) to be associated with pain. The latter findings emphasized that pain appeared early in the course of ADPKD, when patients still exhibited preserved renal function.

In conclusion, the present analysis disclosed that renal volume (9-fold increased risk) and nephrolithiasis (4-fold increased risk) were the most important determinant factors for pain in ADPKD patients with preserved renal function, after adjustments for the presence of hypertension and duration of the disease.

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TABLE 1 MULTIPLE REGRESSION ANALYSIS FOR RELATIONSHIP BETWEEN PAIN AND VARIABLES

	OR (95% CI)	<i>p</i>
Renal volume ≥ 380 mL	8.99 (2.59-31.20)	< 0.001
Nephrolithiasis	4.10 (1.17-14.35)	0.027
Hypertension	2.03 (0.65-6.48)	0.224
Hematuria	0.27 (0.07-1.02)	0.052
Duration of illness	0.99 (0.909-1.071)	0.750

OR:Odds ratio; 95% CI: Confidence interval.