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Body Surface Area (BSA) as the Predictor of Renal Parenchymal Volume in Healthy Adult

Abstract

Purpose of Study: To determine whether body surface area (BSA) as an indicator for body size correlates with renal parenchymal volume in healthy adult. Body surface area is a simple indicator to predict renal parenchymal volume.

Materials and Methods: A randomly selected 41 healthy adult volunteers were subjected to body weight and body height measurement, BSA calculation and ultrasound examination in supine and/or lateral decubitus position to measure renal dimensions. Renal parenchymal volume was calculated through subtraction of renal volume with central echogenic area. Data were analyzed with Pearson's correlation and regression analysis.

Results: Median volumes of right and left renal parenchyma were 86.48 cm³ and 113.3 cm³, respectively. We found that right kidney parenchymal volume had best correlation with body weight (r = 0.576; p < 0.05), followed by BSA (r = 0.569; p < 0.05) and body height (r = 0.435; p < 0.05). Left kidney parenchymal volume had best correlation with BSA (r = 0.672; p < 0.05), followed by body weight (r = 0.644; p < 0.05) and body height (r = 0.562; p < 0.05). Prediction formula: (1) right kidney parenchymal volume = -96.889 + 116.684 · BSA; (2) left kidney parenchymal volume = -108.735 + 141.254 · BSA. Conclusion: Kidney parenchymal volume can be predicted by body weight and BSA, but body height can predict it slightly poorer than body weight and BSA.