The effect of different drinking and voiding preparations on MRI bladder distention in normal volunteers and patients

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Introduction: Having optimal bladder distention is key for the adequate assessment of bladder tumours on MRI [1]. However, there is a lack of consensus in the literature on what drinking and/or voiding preparation should be employed to achieve this [2].

Purpose: To evaluate the effect of drinking and voiding preparations on bladder distention (BD) in normal volunteers (NVs) and patients to establish an evidence-based preparation routine prior to diagnostic bladder MRI.

Methods: This prospective study included 15 male NVs, undergoing 3T-MRI on four separate days, after completing each of the following preparations: preparations 1 and 2 involved passing urine 2 and 1 hour prior to the scan, respectively. Preparations 3 and 4 required passing urine 1 hour prior to scanning and drinking 250 mL and 500 mL water, respectively. In an additional questionnaire study, 94 patients were divided into four groups to match the NVs study. BD was evaluated using a five-point Likert scale; 3 = optimal distention, 1 = collapsed, 5 = over-distention including motion. After initial scoring, wherein 1=5=1, 2=4=2, 3=3; sub-analysis of the best preparations was performed by time of day; for correlation analysis, Spearman's test was used.

Results: In NVs, preparation 1 led to the highest average BD score (2.4) in late day and showed the overall strongest positive correlation with BD score ($r_s = 0.470$; $P < 0.001$). In early morning, preparation 3 achieved the best BD score (1.8), however, the correlation was non-significant ($r_s = 0.461$; $P = 0.06$). No significant effects of any preparations on BD score were observed in patients.

Conclusion: Voiding with no drinking 2 hours prior to MRI achieves the best BD score. However, extra fluid may be necessary to achieve optimal BD in morning scans.

Источники и литература

1 Panebianco V., Barchetti F., de Haas R.J., et al. Improving Staging in Bladder Cancer: The Increasing Role of Multiparametric Magnetic Resonance Imaging // Eur Urol Focus. – 2016. – Vol.2, № 2. – P. 113–21.

2 Barentsz JO, Ruijs SH, Strijk SP. The role of MR imaging in carcinoma of the urinary bladder // AJR Am J Roentgenol. – 1993. – Vol. 160, № 5. – P. 937–47.
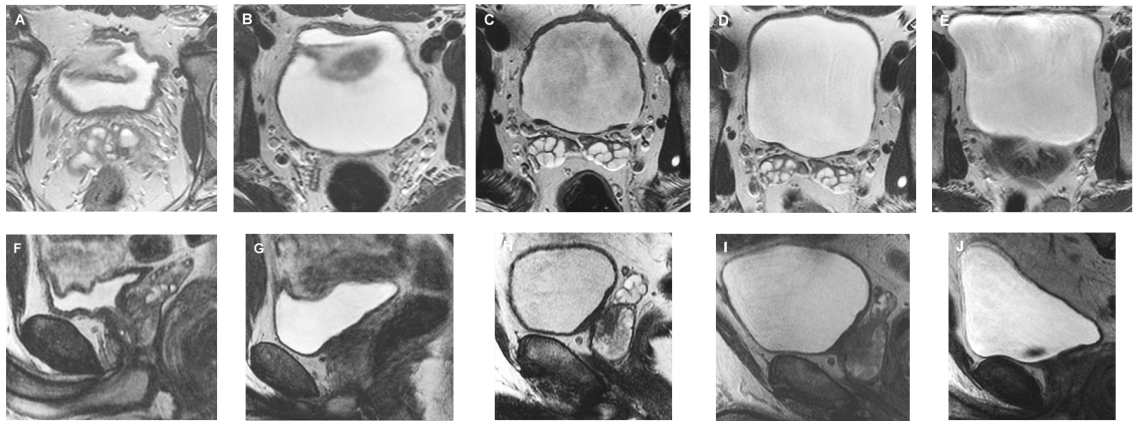
Иллюстрации

Рис. 1. Axial (a-e) and sagittal (f-j) T2WI MR images representing bladder distention (BD) scores 1 (a, f), 2 (b, g), 3 (c, h) 4 (d, i), and 5 (e, j).