

BLADDER BLOOD FLOW USING LASER DOPPLER FLOWMETRY AND BLADDER CAPACITY AFTER HYDRODISTENSION IN INTERSTITIAL CYSTITIS

Hypothesis / aims of study

Interstitial cystitis (IC) is a chronic pelvic pain syndrome of unknown cause. The ischemia of the bladder wall is thought to be one of the causes. Although there is no standard treatment, hydrodistension is useful for most IC patients.

We measured the bladder blood flow in IC patients at hydrodistension and investigated the role of blood flow in relation to the bladder capacity after hydrodistension.

Study design, materials and methods

We measured the blood flow at the trigone and posterior wall of the bladder wall using the Laser Doppler Flowmetry in hydrodistension of the bladder under spinal anesthesia on 28 IC patients. We evaluated the average voided volume (AVV) and the maximum voided volume (MVV) from a frequency volume charts and the O' Leary-Sant's symptom / problem scores before and at 2 and 6 months after hydrodistension.

Results

Bladder blood flow at the posterior wall of the bladder at a capacity of 100ml increased significantly from 18.5 ± 8.7 ml/min (median 15.0ml/min) to 30.3 ± 12.8 ml/min (median 28.7ml/min) after hydrodistension. From that result, we divided IC patients into two groups; one was the over 30.0ml/min (group I; $n=13$) and another was the under 30.0ml/min (group NI; $n=15$) of their bladder blood flow after hydrodistension. The MVV in group I was larger than that in group NI before hydrodistension ($p<0.04$).

The AVV and the MVV increased significantly from 83 ± 32 ml, 167 ± 51 ml to 191 ± 72 ml, 321 ± 109 ml at 2 months and 203 ± 67 ml, 356 ± 141 ml at 6 months after hydrodistension in group I, respectively ($p<0.001$). The AVV and the MVV also increased significantly from 76 ± 34 ml, 132 ± 52 ml to 155 ± 66 ml, 239 ± 82 ml at 2 months and 159 ± 70 ml, 242 ± 99 ml at 6 months after hydrodistension in group NI, respectively ($p<0.001$). The MVV at 2 months after hydrodistension improved significantly in group I compared with group NI ($p<0.02$). Both the AVV and the MVV at 6 months after hydrodistension improved significantly in group I compared with group NI ($p<0.05$, $p<0.01$, respectively).

The O' Leary-Sant's symptom / problem scores decreased significantly from 14 / 13 to 6 / 4 at 2 months and at 6 months after hydrodistension in group I. The symptom / problem scores decreased significantly from 15 / 12 to 7 / 6 at 2 months and 6 / 4 at 6 months after hydrodistension in group NI. There is no significant differences in the symptom score at both 2 and 6 months after hydrodistension between group I and group NI.

Interpretation of results

Hydrodistension is effective for the improvement of the AVV, the MVV and the symptom / problem scores in IC patients. IC patients who were the over 30.0ml/min of their blood flow after hydrodistension improve the AVV and the MVV at 6 months after hydrodistension compared with the under 30.0ml/min of their blood flow after hydrodistension.

Concluding message

We surmise that the ischemia of the bladder is one of the main reasons of decreasing their bladder capacity in IC patients. It may be suggested that the improvement of bladder blood flow plays an important role in the treatment of IC patients.