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THE RELATIONSHIP BETWEEN SPINA BIFIDA OCCULTA AND THE TREATMENT OF PRIMARY NOCTURNAL ENURESIS IN CHILDREN

Hypothesis / aims of study
To investigate the relationship between the spina bifida occulta (SBO) and the response to treatment of primary nocturnal enuresis (PNE).

Study design, materials and methods
Between July, 2011 and December, 2013, the diagnosis and treatment records of 163 children with primary nocturnal enuresis were reviewed. The frequency of bedwetting occurred at least once a week in these children. They all had arousal dysfunction. Children with other organic urological diseases or symptoms suggestive of spinal dysraphism were excluded. Voiding diary was routinely recorded before the start of PNE treatment, and then was recorded for 3 days every month during the treatment programs. The functional bladder capacity (FBC) data was collected from voiding diary. The children with SBO were confirmed by X ray. The routing urine test was carried out before, during and after the study to rule out UTI. All patients were divided into two groups: SBO groups and non-SBO groups. They were given the same treatment programs. The frequency of enuretic episodes per week was recorded. The follow-up was carried out once a month for at least half a year. Response to the treatment of children with and without SBO was compared through statistical analysis with SPSS 17.0 software.

Results
Of 163 children, SBO was detected in 122 children (74.8%)(9.8±2.3 years), and 69 of them were boys. The skin signs of SBO were found in the lower part of back in 55 children. Of 41 children without SBO (9.5±2.5 years), there were 24 boys and 17 girls. There was no significance between the two groups in age ($P>0.05$), and so was the FBC before treatment (SBO (216.5±49.5) ml , non-SBO (217.4±47.3) ml, $P>0.05$). There was a significant difference between the two groups in the increment of FBC after treatment (SBO (11.9±4.4) ml, and non-SBO (24.1±6.6) ml, $P<0.05$). There was no significance in the frequency of enuretic episodes before treatment (SBO groups was 3.4±1.2, and non-SBO groups was 3.1±1.0, $P>0.05$).In the SBO group, 25(20.5%) patients showed a complete response, 25(20.5%) showed a response, 34 (27.9%) showed a partial response and 38 (31.1%) showed no response. Of the 41patients without SBO, 20 (48.8%) showed a complete response, 10 (24.4%) showed a response, 9 (22.0%) showed a partial response and 2 (4.8%) showed no response. There was a significant difference between the SBO and non-SBO groups in terms of outcome ($P<0.001$), with a complete response more likely in children without SBO ($P<0.001$).

Interpretation of results
In this study, there was a significant difference between the two groups in the increment of FBC after treatment, suggesting the presence of SBO could affect bladder capacity and treatment results. We speculate that the existence of SBO affects the neural development of lumbosacral area, which can injure the control mechanism of urination function, such as low night bladder capacity, detrusor overactive, etc. Meanwhile, in the patients with SBO, bladder filling may not stimulate the sacral nerve excitement sufficiently, which makes the stimulation intensity of cerebral cortex lower than waking threshold, causing the disorder of arousal. Thus, as a result of the existence of SBO, the severity of nocturnal enuresis symptoms may increase, so is the difficulty in treatment. In this study, as dynamics tests are invasive and some patients are unwilling to do the tests, the tests haven't been done in all of the participated children. Thus it is unable to prove whether there is the existence of low night bladder capacity or detrusor overactive and it need to be further studied in the future. Whether arousal dysfunction is more serious in children with SBO needs to be confirmed by the examination of electroencephalogram in the future.

Concluding message
The response of treatment is better in PNE children without SBO than those with SBO. The mechanism involved in the treatment response needs to be further investigated in the future.

Disclosures
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