

## **RISK FACTORS FOR URINARY TRACT IN MYELOMENINGOCELES NOT TREATED REGARDING URINARY DYSFUNCTIONS**

### **Aims of Study**

To evaluate myelomeningocele patients not submitted to previous treatment of the urinary dysfunction, seeking to define the bladder and sphincter functional alterations, and the risk factors for the integrity of upper urinary tract. This group of patients represents the closest we can be to the natural history of the disease.

### **Methods**

We studied 104 patients with myelomeningocele without previous evaluation nor medical and surgical treatment of the vesical dysfunction. Male to female ratio was 49:55. The age at presentation was less than 2 years (n=17), 2 to 4 years (n=20), 4 to 6 years (n=23), 6 to 12 years (n=24) and above 12 years (n=20). The dorsal defect was closed in less than 1 day after birth in 37 children, between 1 to 30 days in 42, between 1 to 12 months in 13, and more than 12 months in 8, being uncertain in 4. The most frequent associated malformations were hip dislocation in 6, clubfoot in 4 and renal agenesis in 3. All patients were evaluated by anamnesis, physical exam, urinalysis, urodynamics, ultra-sound, intravenous urography and cystography. The variables were submitted to statistical analysis, with a significance level of 5%.

### **Results**

Twenty nine percent of the patients presented with vesico-ureteral reflux and 26 % had ureterohydronefrosis, with no differences regarding the age groups ( $p=0.27$  and  $p=0,74$  respectively). Bladder evaluation showed hyperreflexia in 48%, low compliance in 49 %, low pressure in 2 % and normality in 1 %. Reflux and upper urinary tract deterioration were not related to the bladder functional status ( $p=0.27$  and  $p=0.82$ ). Detrusor leaking point pressure (DLPP) equal or above 40 cm H<sub>2</sub>O correlated with upper urinary tract deterioration ( $p<0.001$ ) and with reflux ( $p=0.007$ ). Bladder volumes at 20 cm H<sub>2</sub>O also did not correlate with damage of the upper tract ( $p=0.17$ ) and with the presence of reflux ( $p=0.20$ ). Bladder true functional volume was the volume at the DLPP minus the residual urine at the beginning of the urodynamic evaluation. This volume was compared to the expected volume for the age. Bladder functional volumes less than 33% of the normal to the age correlated with more upper urinary tract deterioration ( $p=0.01$ ), in spite of similar detrusor leaking point pressures (50.8 cm H<sub>2</sub>O and 50.3 cm H<sub>2</sub>O,  $p=0.9$ ). Symptomatic infection had a direct relationship to detrusor leaking point pressure ( $p=0.007$ ).

### **Conclusions**

DLPP above 40 cm H<sub>2</sub>O is a risk factor for the integrity of the upper urinary tract and to the development of symptomatic urinary infection. Bladder true functional volume constitutes another risk factor, if smaller than 33% of the expected volume for the age and constitutes a new parameter not related to detrusor leaking pressures. Upper urinary tract alterations occurred similarly in the different ages and differs only in intensity, what implies that they establish early in children with myelomeningocele.