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Case Study

Neuro-urological surveillance of Spina bifida in Morocco

Abstract

Objective: Spina bifida is one of the first caused of disability with children in USA. This incidence was estimated to 3.5 per 10000 habitants. In France, it was mostly, 0.5 per 1000 habitants. The improvement in neuro surgery and in urology allowed a veritable reduction of mortality with spina bifida.

Method: It was a retrospective descriptive and analytic study with children suffering of spina bifida and followed up between january 2013 and december 2015 at the department of Physical Medicine of Casablanca.

Results: Twenty six patients were followed up. The average age was 11.9 +/- 5.8 years. These urinary disorders were frequency 100%, urinary incontinence 65.4%, urgency 73.1% and intermittent stream or training 46.2% with significant post void residual 26.9%. In urodynamic studies, bladder sphincter dysynergia was 7.7%, low bladder compliance with 61.5%, phasic or terminal detrusor overactivity 84.6% with 38.5% dangerous. In ultrason, they were 23.1% fight bladder with urinary retrogress and two children had dilatation of upper urinary tract and end stage renal disease, in list for renal transplantation.

Conclusion: The children with spina bifida need follow-up and managment of requirement of care relative to the weight of this affection for children and their parents.

Introduction

A spina bifida is a leading cause of disability among children and adolescents in the United State of America [1]. Its incidence is estimated in 3.5 to 3.7 per 10,000 people in the United State of America (Centers for Disease Control and Prevention. Data and Statistics in the United States, Spina Bifida Homepage [2,3]. In French it is more significant and estimated at 0.5 per 1,000 inhabitants [4], while in Tunisia the prevalence is 2 to 10,000 [5]. Advances in neurosurgery and urology have reduced efficiently mortality among children. This mortality was related to hydrocephalus frequently associated with myelomeningocele, cardiovascular disease and kidney failure [3-6]. These patients must come today to adulthood [7]. It is clear that myelomeningocele is the first congenital disease causing neurogenic bladder [3]. A several types of neurogenic bladder have been described. The overactive detrusor and hypoactive bladder combined with hypertonic sphincter or sphincter hypotonic [4].

In Africa, the therapeutic arsenal is quite poor and is mainly limited to anticholinergic and alpha-blockers. We report the experience of the Department of Physical Medicine and

Rehabilitation of Ibn Rochd in University Teaching Hospital of Casablanca, in neuro-urology monitoring of these children. The objective of this work was to study the parameters of followed-up children victims of spina bifida

Patients and Methods

Patients

All myelomeningocele patients followed in Department of Physical Medicine and Rehabilitation of Ibn Rochd in University Teaching Hospital of Casablanca for neurogenic bladder between january 2013 and december 2015.

Inclusion criteria

All patients followed in neuro- urology, who had a urodynamic exploration, a dosage of creatinine and a bladder-renal ultrasonography were included.

Non inclusion criteria

Were excluded from the study, patients with morphological abnormalities of the lower urinary tract with malformations or tumor origin, may explain the urinary disorders

Study Type

We have conducted a retrospective, descriptive and analytical study of patients enrolled in the Department of Physical Medicine and Rehabilitation of Ibn Rochd in University Teaching Hospital of Casablanca, Morocco, for neurogenic bladder in spina bifida between January 2013 and December 2015.

Evaluation

Beside neurological and perineal examination, the patients underwent urodynamics composed of a flow measurement coupled to the electromyography (EMG) produced by using skin patches, two located on either side of the perianal region or a thigh. As soon as the need to urinate is felt by the child, he was asked to urinate in the flow meter, connected to the computer. A screen was placed to prevent mental block. A catheterization was performed after urination to determine the post voiding residue. This residue is significant when it exceeds 10% of the volume urinated. Dysuria was defined as voiding by abdominal thrusts, for very long with a weak stream and the lack of overall appearance bell curve for flow measurement. A lack of relaxation of perineal muscles during miction, resulting in a significant and frequent recruitment on the EMG: it's bladder sphincter dyssynergia. Cystometry was conducted through bladder filling with saline 0.9% at a rate of 20ml/min on a patient in the dorsal position. The filling was stopped at "strong urge" and compared to the bladder capacity calculated for the patient's age. Compliance was assessed by the ratio of filling volume on the change in pressure. The hypocompliance was defined by a lower compliance to 20 mL/cmH₂O and detrusor overactivity by a sudden change of more than 15 cmH₂O pressures. When phasic or terminal hyperactivity, lasts over time and exceeds 40 cmH₂O, it is dangerous for the upper urinary tract. Profilometry was not performed because no interest in the exploration of children. The parameters studied were: age, sex, level of injury, urinary and anorectal disorders, abnormalities of the bladder wall and the expansion of the upper urinary tract and urodynamic abnormalities. Therapy proposed to these patients was also noted.

Analysis of data

The data were entered and analyzed using Epi Info version 3.4.3. The quantitative variables were compared with those qualitative through statistical test Anova. The significance level was $p < 0.05$

Ethical considerations

The information was collected with the strict and rigorous respect of anonymity, confidentiality and medical secrecy.

Results

After the recount, 26 patients were recruited. It was the youth of these patients, the average age was 11.9 +/- 5.8 years, table 1. The sociodemographic, clinical and urodynamic parameters were summarized in table 1,2. Were concerned 42.3% of males, 57.7% of females, Urinary tract Infection repeat 38.5%, dysuria

46.2%, overactive bladder 100%, anal incontinence 11.5 and sensitive and motor deficit table 1,2, post voiding residue 26.9%, Dyssynergia 7.7%, Detrusor overactive 84.7%, Overactive detrusor dangerous 38.5% and Hypocompliant bladder 61.5% with Self-catheterization 69.2% were observed. The urge incontinence was significantly associated with the occurrence of uro nephrology and kidney complications. Urinary leakage multiplied by 3 the risk of hypocompliance while repeated urinary tract infections and urgency multiplied the risk respectively by 1.4 and 1.8 in table 3.

Discussion

Improve life expectancy of children suffering from myelomeningocele, correlates with new problems such as impaired quality of life of patients and their parents, mothers in particular, multidisciplinary medical care, which must be rigorous and codified and the question of sexuality of these future adults [6-12]. The management and the neuro-urology monitoring of children victims of spina bifida in the Department of Physical Medicine and Rehabilitation of Ibn Rochd in University Teaching Hospital of Casablanca, was the result of inter department collaboration that allows to make many observations. It was the youth of these patients [13], the average age of 11.9 +/- 5.8 years table 1. A study by Szymanski and al., [8], on a larger population (369 patients) reported a similar mean age 10.8 years. More than 21 years patients were excluded in their study, however this young population of patients with myelomeningocele was important. Only sexual disorders studies in this pathology report an adult who remains as young as 27.7 +/- 5.9 [11]. Although life expectancy has improved [14,15], it remains very low. The

Table 1: Distribution of patients like sociodemographic and clinical data.

	N	%
Age (in years)	26	11.9 +/- 5.8
Sex		
Male	11	42.3
Female	15	57.7
Symptoms		
Urinary tract Infection repeat	10	38.5
Overactive bladder	26	100
Dysuria	12	46.2
Urgency	7	26.9
Leak	9	34.6
Constipation	9	34.6
Anal incontinence	3	11.5
Lesional levels and deficit		
Thoracic	2	7.7
Thoraco-lombar	5	19.2
Lombar	12	46.2
Lombosacral	7	26.9
Motor deficit	10	38.5
Sensitive deficit	2	7.7
Spasticity	6	23.1

follow-up study of Szymanski and al., [8], clearly showed that these patients did not die or fewly by kidney complications but by infections or obstruction of peritoneal shunt, urological or other origin sepsis, lung infections and birth defects, public road accidents and even suicide. Our study suggests a neuro-urology profile that correlates with the four neurogenic bladder profiles described by Gamé and al., [4]. This dysfunction caused complications such as alteration of the bladder wall, upper urinary tract reflux, dilatation of the upper urinary tract with, urinary tract infections, stones and kidney failure. No bladder cancer has been reported today in spina bifida patients. Knowledge of urinary tract functioning in myelomeningocele has given rise to the current therapeutic arsenal [8,12].

The follow-up recommendations and proposed treatment are adequate, compatible with the management of myelomeningocele in Morocco. Anticholinergics are widely command and fairly well accepted by children and their parents. While, self- and hetero-catheterization were most difficult to accept for those children, it was proposed for them. This difficulty has already been neuropsychological disorders in these children associated hydrocephalus. In addition to this tremors, incoordination and grip that give heavier disability related to myelomeningocele. We understand that 30.8% of these children were at hetero-catheterization with their risks table 2. In Casablanca, detrusor injections of botulinum toxin just started and are sparingly. Although without authorization on the market for children, its efficacy is recognized and could be offered to these patients. In our study population, two children had end stage kidney failure and were waiting to a kidney transplantation. This fact limits the spring for monitoring these fragile people, followed though highly codified in French

Table 2: Distribution of patients according to the paraclinical and therapeutic data.

	N	%
Urodynamic		
Post voiding residue	7	26.9
Dyssynergia	2	7.7
Detrusor overactive	22	84.7
Overactive detrusor dangerous	10	38.5
Hypocomplianc bladder	16	61.5
Treatment		
Shunt peritoneal	18	69.2
Anticholinergic	20	77
Anticholinergic+ alpha-blocker	2	7.7
posterior tibial stimulation	5	19.2
bladder enlargement	3	11.5
continent cystostomy	4	15.3
Type of emptying		
Self-catheterization	18	69.2
Hetero-catheterization	8	30.8
Complications		
Upper urinary tract reflux	6	23.1
Dilatation of the upper urinary tract	2	7.7
kidney failure	2	7.7

Table 3: Distribution of patients according to factors associated with complications and compliance abnormalities.

	Upper urinary tract reflux	Dilatation of the upper urinary tract	OR IC (95%)	p-value
Age (in years)	9.8 +/-41	10+/-8.5		0.8*
Dysuria	1	0		0.2
Urinary tract Infection à repeat	3	2		0.5
Overactive bladder	4	2		0.2
Urgency	2	2		0.02
Leak	3	2		0.5
Constipation	3	0		0.1
Dyssynergia	1	0		0.4
Compliance	2	1		0.8
	Hypocompliance	Normal compliance		
Age (in years)	9.9+/-3.8	12+/-4.7		0.2*
Dysuria	7	5	0.8 [1.1 ; 4.1]	0.5
Urinary tract Infection repeat	6	4	1.4 [0.2 ; 8.2]	0.4
Urgency	5	2	1.8 [0.3;16.2]	0.4
Leak	9	8	3 [0.5 ; 26.3]	0.2
Constipation	6	3	1.4 [0.2 ; 8.8]	0.5
Dyssynergia	1	1	0.6 [0.01 ;26]	0.6
	HAD	HAD dangereuse		
Age (in years)	10+/-4	11.4+/-4.9		0.7*
Dysuria	5	4		0.5
Urinary tract Infection repeat	2	3		0.2
Urgency	3	4		0.3
Leak	3	3		0.2
Constipation	4	2		0.1
Dyssynergia	1	1		0.8

and in other countries [14], still suffers from shortcomings of the Moroccan health organization that has undoubtedly bright future with development of the medical assistance regime of Morocco, RAMED. Therapeutic efforts are needed to improve the quality of life expectancy of these patients in Morocco. Moroccan prevalence myelomeningocele [15], is well above that reported in the United States (Centers for Disease Control and Prevention. Data and Statistics in the United States, Spina Bifida Homepage [2-4], French [4], Tunisia [5] and Kenya [16], 12.1 per 10,000 live births children. The weight of this failure on quality of life of children, their parents, the quality of the sexuality of these children reach adulthood, independence and life expectancy are to be evaluate. On the neuro-urology level, rigorous monitoring is to be organized. This monitoring will prevent the occurrence of complications or take care and improve the quality of life of these patients. According to the parameters covered, only urge incontinence seemed to be related to the occurrence of complications uro-nephrologics while compliance problems, reported in studies as a prognostic

factor in neurogen bladder [17,18], was not related to the occurrence of complications table 3. Our statistical analysis confirmed the lack of parallelism between the clinic and the results of urodynamics. Therefore, it is essential to have a good exploration before the initiation of the most suitable therapy. Physical medicine monitoring is also essential and ensures efficient patient autonomy [19–21].

The limitations of this work are mainly the reduced sample size and the need to analyze the becoming of these children.

Conclusion

Children victims of spina bifida have follow-up and management problem with many care needs imposed by the affection for both children and their parents. The few children who come to the neuro-urology balance in UTH of Casablanca have a fairly standard profile. Therapeutic efforts are needed to improve the quality of life and life expectancy of these patients Morocco.

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