Arch. Esp. Urol. 2009; 62 (2): 115-121

STUDY OF FEMALE URINARY INCONTINENCE WITH SINGLE CHANNEL URODYNAMICS: COMPARISON OF THE SYMPTOMS ON ADMISSION. ANALYSIS OF 590 FEMALES.

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Summary.- *OBJECTIVES: To compare the clinical diagnosis of the urinary incontinence with the results obtained by MoniTorr™ urodynamic test.*

METHODS: Prospective study of 590 consecutive patients with symptomatic urinary incontinence, between January 2006 and June 2008, at the Urogynecology and Vaginal Surgery Unit, Obstetrics and Gynecology Department, Clínica Las Condes, Santiago, Chile. Median age was 55 years (Range 30-91 years). In all patients the type of urinary incontinence (stress, mixed or urgency) was classified according to symptoms and signs observed during the first approach. Urodynamic test with a non-multichannel system was performed (retro-resistance pressure and cystometry were measured) and incontinence was classified in accordance to the parameters obtained. The clinical diagnoses were compared with the urodynamic test results.

RESULTS: In 420 patients with clinical diagnosis of stress urinary incontinence (SUI) urodynamics registered 43 (type 0), 4 (I), 181 (II), 2 (III), 118 (II+III), 21 (0+HD), 26 (II+HD), 3 (III+HD) and 22 (II+III+HD). In 92 with Mixed Urinary incontinence urodynamics registered 17 (0), 16 (II), 20 (II+III), 9 (0+HD), 12 (II+HD), 1 (III+HD) and 17 (II+III+HD). In 78 women with urgency incontinence, urodynamics registered 32 (normal), 2 (I), 5 (II), 5 (II+III), 27 (HD), 3 (II+HD) and 4 (II+III+HD).

CONCLUSIONS: The non-multichannel MoniTorr™ test is an objective method to demonstrate the urinary incontinence diagnosed clinically. The urodynamic test is a complementary examination, very useful in the study of urinary incontinence. The clinical diagnosis can be different to objective urodynamic diagnosis. The urodynamic study allows planning the solution adapted for each patient.

Keywords: *Urinary incontinence. Urodynamic. Non-multichannel urodynamic.*

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Accepted for publication: September 2nd, 2008.

Resumen.- *OBJETIVO: Comparar el diagnóstico clínico de la incontinencia de orina con los resultados obtenidos a través del estudio de urodinamia monocanal.*

MÉTODO: Estudio prospectivo de 590 pacientes con síntomas de incontinencia urinaria, ingresadas a la Unidad de Uroginecología y Cirugía Vaginal de Clínica

Las Condes, entre enero del 2006 y Junio del 2008. La mediana de edad del grupo en estudio fue de 55 años (30 a 91 años). En todas se clasificó el tipo de incontinencia (esfuerzo, mixta o urgencia) al ingreso, de acuerdo a la clínica (síntomas y signos) observada en la primera consulta. Luego se realizó urodinamia con el sistema monocanal (se midió la presión de retro-resistencia uretral y cistometría) y se clasificó el tipo de incontinencia de acuerdo a los parámetros obtenidos en el examen. Se compararon los resultados clínicos con los de la urodinamia.

RESULTADO: En 420 pacientes con diagnóstico clínico de incontinencia de orina de esfuerzo, la urodinamia registró: 43 (tipo 0), 4 (I), 181 (II), 2 (III), 118 (II+III), 21 (0+detrusor hiperactivo), 26 (II+DH), 3 (III+DH) y 22 (II+III+DH). En 92 con incontinencia de orina mixta la urodinamia demostró 17 (0), 16 (II), 20 (II+III), 9 (0+DH), 12 (II+DH), 1 (III+DH) y 17 (II+III+DH). En 78 mujeres con incontinencia de urgencia la urodinamia registró 32 (normal), 2 (I), 5 (II), 5 (II+III), 27 (DH), 3 (II+DH) y 4 (II+III+DH).

CONCLUSIONES: La urodinamia monocanal Moni-Torr™ es un método objetivo para demostrar la incontinencia de orina, diagnosticada por método clínico. La urodinamia constituye un examen complementario muy útil en el estudio de la incontinencia de orina. El diagnóstico clínico puede ser diferente al diagnóstico objetivado por urodinamia. El estudio urodinámico permite planificar una solución adaptada a las características de cada paciente.

Palabras clave: *Incontinencia de orina. Urodinamia. Urodinamia monocanal.*

INTRODUCTION

Urinary incontinence is a disease with a high frequency which has a negative impact on quality of life (1,2). It is a diagnosis that increases gradually with age (3) The highest survival and longevity of current women necessarily lead to further increase this pathology in the near future.

A study with 2875 adult women found an incidence of 23.7% stress urinary incontinence, 9.9% urge and 14.5% mixed. This study found the highest prevalence in the fifties years (4). A publication this year showed that urinary incontinence is most common in white women, compared to black women (5).

The history and physical examination and even add some test, appear to have a low value on the proper diagnosis of stress urinary incontinence (6). The clinical and physical examination have a greater correlation with the correct diagnosis of urge urinary incontinence (7).

The urge incontinence is usually treated by medical and pharmacological treatments, however stress urinary incontinence may require a surgical treatment (8). For these reasons, the study of these patients requires tests that can objectify and clarify the diagnosis that we make in our office.

Every day appear more and better treatments for both medical and surgical correction of incontinence, however the correct choice will depend on a good diagnosis in each case (9).

Many articles in medical literature discuss when the urodynamic should be an important consideration in the urinary incontinence study. Some physicians suggest that the urodynamic is not necessary in those patients who have an evident stress urinary incontinence, and should be reserved for those patients with evidence of urge incontinence or mixed or when there is doubt (10,11). Another indication is suggested in the study of women with failure of anti-incontinence surgery prior suspicion of obstruction, failure of first-line treatments and reduced bladder capacity (10).

In order to compare the clinical diagnosis of urinary incontinence with the results obtained through the study of non-multichannel urodynamic test, we present our experience with consecutive 590 cases.

PATIENTS AND METHOD

A prospective study of 590 women admitted for clinical diagnosis of urinary incontinence at Urogynecology and Vaginal Surgery Unit in Clínica Las Condes, Santiago, Chile, between January 2006 and June 2008.

Characteristics of the group under study:

The ages ranged between 30 and 91 years, with a median of 55 years. The parity was between 0 and 5, median 3. Mean body mass index of 26. (Table I).

Inclusion criteria:

1.- Women were admitted for clinical diagnosis of urinary incontinence based on the history and physical examination, made in the first medical consultation.

2.- They should have a permanent urinary incontinence for at least one year of evolution.

Exclusion criteria:

1.- Urinary tract infection. In all women entering the study we ruled out the presence of a urinary tract infection detected in the study of urine sediment and uroculture.

2.- Urethral obstruction. When a urinary obstruction is diagnosed a study should be complete with multichannel Urodynamic test. This condition is more common in males, for example due to prostatism.

Urodynamic Study:

We used the Non-multichannel Urodynamic MoniTorr™ equipment (Gynecare, Wordwide, a division of Ethicon Inc., Johnson & Johnson Company, Somerville, New Jersey) (Figure 1). It consists of a microprocessor unit (portable and rechargeable) and two disposable devices. One is to measure the urethral retro-resistance pressure (URP) (12) and the other for the cystometry (CM) (Figures 2 and 3). The electronic unit is connected to these disposable devices only one at a time, depending on the measurement to be made. The URP devices have a cone that is placed in the urethra as a stopper to make the measurement. In contrast, CM has a 7-french catheter that is inserted into the urethra.

Kind of stress urinary incontinence:

To classify the type of stress incontinence to be objectified by the Non-multichannel urodynamics measurement with URP, we used the classification of McGuire et al. (13) (Table II).

Comparison of clinical diagnoses and urodynamic:

Once to make the urodynamic a diagnosis was obtained in accordance with the parameters. Then it was compared to clinical diagnosis of the first office consultation.

RESULTS

Of the total 590 patients entered the study, 420 (71%) had stress urinary incontinence as was

TABLE I. CHARACTERISTIC OF PATIENTS IN THE STUDY.

Total patients in the study: 590 patients

Inclusion criteria:

1.- Women were admitted for clinical diagnosis of urinary incontinence, based on the history and physical examination made in the first office medical consultation.

2.- Permanent Urinary incontinence for no less than one year.

Exclusion criteria:

1.- Urinary tract infection. In all women entering the study were ruled out the presence of a urinary tract infection through the sediment urine study and uroculture.

2.- Urethral obstruction. When this defect is detected the study is by multichannel Urodynamics test.

Type Urodynamics:

Non-multichannel MoniTorr Urodynamics test (Gynecare, Wordwide, a division of Ethicon Inc., Johnson & Johnson Company, Somerville, New Jersey). It consists of a microprocessor unit (portable and rechargeable electronic device) and two disposable devices. One is to measure the pressure of urethral retro-resistance (URP) and the other for the cistometry (CM).

Period of study: Between January 2006 and June 2008

Age of patients: Between 30 and 91 years old, median 55 years old.

Parity of patients: From 0 to 5, median 3.

BMI of patients: Median 26.

TABLE II. CLASSIFICATION OF STRESS URINARY INCONTINENCE ACCORDING TO THE URODYNAMIC STUDY.

Tipo 0:	Incontinence referred by the patient, but that is not proven by clinical examination or by the urodynamic study.
Type I:	Stress urinary incontinence with leak point pressure major to 90 cmH_20 and bladder neck and urethral hypermobility of less than 2 cm.
Type II:	Stress urinary incontinence with leak point pressure under 90 cmH_2O and bladder neck hypermobility of the urethra and a 2 cm higher.
Type III:	Intrinsic urethral insufficiency with leak point pressure fewer than 60 cm H_2O.

Classification of McGuire et al. (12)

demonstrated by history and physical examination at the first office consultation. A total of 92 (16%) women had mixed urinary incontinence and 78 (13%) had urge incontinence. (Table III.)

Of the 420 patients with clinical stress urinary incontinence, the Urodynamic showed: 43 type 0, 4 type I, 181 type II, 2 type III, 118 type II + III, 21 Type 0 + overactive detrusor (OD), 26 type II +OD, 3 type III+OD, 22 type II + III + OD. (Table III.)

Of the 92 patients admitted by symptoms of mixed urinary incontinence the Urodynamic showed: 17 type 0, 16 type II, 20 type II + III, 9 Type 0 + OD, 12 type II + OD, 1 type III+OD, 17 Type II + III + OD. (Table III).

Of the 78 admitted with a clinical diagnosis of urge incontinence to the clinic, the Urodynamic showed: 32 normal, 2 type I, 5 type II, 5 type II + III, 27 OD, 3 type II + OD, 4 type II + III + OD.(Table III).

In summarizing the urodynamic results of the 420 patients admitted for stress urinary incontinence: 305 (73%) cases were stress urinary incontinence,

TABLE III. CORRELATION BETWEEN THE CLINICAL DIAGNOSIS AND RESULTS OF NON-MULTICHANNEL URODYNAMICS TEST.

Clinical Diagnosis	**Non-multichannel Urodynamics test**											
	Normal	**0**	**I**	**II**	**III**	**II+III**	**OD**	**0+OD**	**II+OD**	**III+OD**	**II+III+OD**	**Total**
SUI	____	43	4	181	2	118	–	21	26	3	22	420
MUI	____	17	-	16	-	20	–	9	12	1	17	92
IU	32	____	2	5	-	5	27	____	3	-	4	78
Total	**5,4%%**	**10,2%**	**1%**	**34,2%**	**0,3%**	**24,2%**	**4,6%**	**4,9%**	**6,9%**	**0,7%**	**7,3%**	**590**

SUI: Stress Urinary Incontinence. MUI: Mixed Urinary Incontinence. UI: Urge incontinence.
OD: Overactive Detrusor

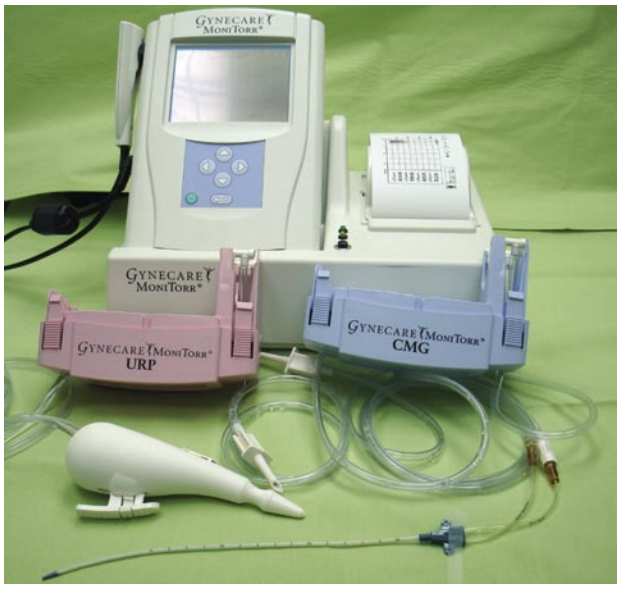

FIGURE 1. Non-multichannel Urodynamic equipment, consisting of a microprocessor and two disposable devices (for measuring the urethral retro-resistance pressure and the other for the cistometry).

51 (12%) cases mixed urinary incontinence, 21 (5%) urge incontinence and 43 (10%) cases with normal parameters (type 0) (Table IV).

In summarizing the urodynamic results of the 92 patients admitted for mixed urinary incontinence: 30 (33%) cases were mixed urinary incontinence, 36 (39%) cases with stress incontinence, 9 (10%) cases of urge incontinence and 17 (18%) cases had normal parameters (Table IV).

In summarizing the urodynamic results of the 78 patients admitted for Urge urinary incontinence: 27 (35%) cases were urge incontinence, 12 (15%) cases stress urinary incontinence, 7 (9%) mixed urinary incontinence and 32 (41%) cases had normal parameters (Table IV).

DISCUSSION

Undoubtedly, new surgical techniques and examinations must find the minimal invasion. Such is the case of new surgeries for urinary incontinence which have evolved simplifying and reducing the potential complications (14). In this context, it has not been outside the urodynamic, this new technology known as non-multichannel test. This is a minor Urodynamic invasion. This equipment can measure the pressure of retro-urethral resistance through a cone which is placed in the urethral meatus. This technology will allows us to classify the type of stress urinary incontinence. On the other hand, with the same concept of minor invasion we can made through a small tube or catheter of 7-french, a cystometry showing pathologies like an overactive detrusor. This is an urodynamic equipment designed only for women who not require a multichannel urodynamic test. The non-multichannel test had a contraindication for patients with urethral obstructive diseases.

The non-multichannel urodynamic test is presented as an appropriate tool with potential advantages in the study and certification of urinary incontinence in women, handing elements in the diagnosis which will allows us to choose the best solution according to each case.

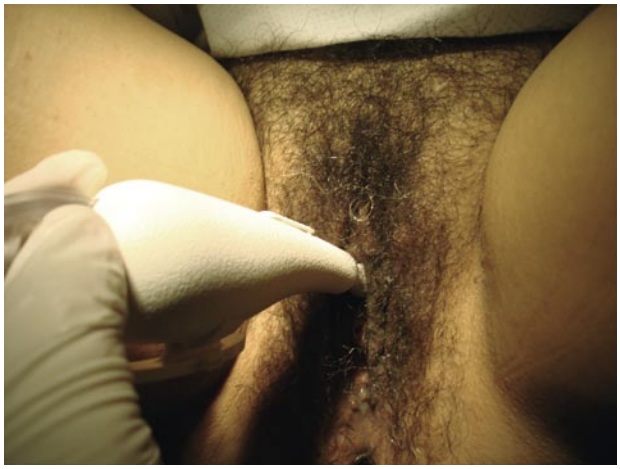

FIGURE 2. Measurement of urethral retro-resistance pressure (URP).

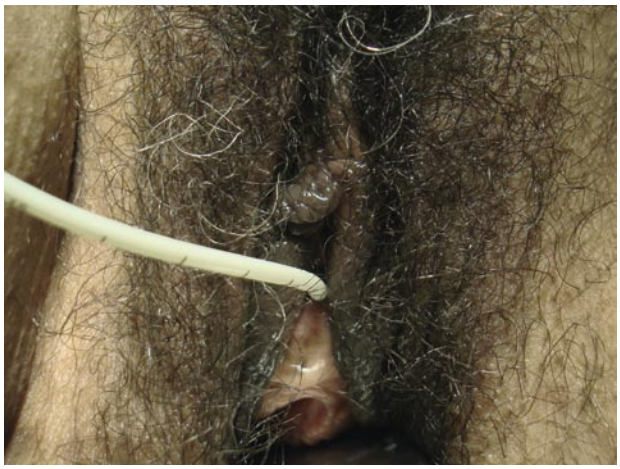

FIGURE 3. Cistometry (CM).

TABLE IV. SUMMARY OF THE CORRELATION BETWEEN THE CLINICAL DIAGNOSIS AND OBJECTIFIED BY THE URODYNAMIC TEST.

Clinical	**Non-multichannel Urodynamic test**				
Diagnosis	**Normal***	**SUI**	**MUI**	**UI**	**Total**
SUI	43	305	51	21	420
MUI	17	36	30	9	92
UI	32	12	7	27	78
Total	**15,6%**	**59,8%**	**14,9%**	**9,7%**	**590**

Normal: with normal parameters in Urodynamics, are also considered the stress urinary incontinence type 0 in this section.*
SUI: Stress Urinary Incontinence
MUI: Mixed Urinary incontinence
UI: Urinary urge incontinence

Different publications have shown that the greatest correlation of the signs and symptoms of incontinence investigated at the office consultation relate better with the final diagnosis of the patient when corresponding to stress urinary incontinence. However, some studies have shown that the symptoms identified less than one quarter of stress urinary incontinence or the cases with overactive detrusor (15). When the study is completed with urodynamic the diagnosis is more assertive and complete (16), especially in difficult cases (17). Symptoms of mixed urinary incontinence can be difficult to specify the diagnosis, the urodynamic study can be useful (18).

Some studies have shown that Urodynamic may increase the possibility of urinary tract infection (19), some suggest the use of antibiotic routinely (20). In our patients in the study we did not find signs or symptoms of this complication in the office subsequent checks. Theoretically, as a test of minor invasion, could be reduced this potential risk.

In general, the Urodynamic is a test that causes anxiety in women who will be subjected to this study (21-23). However, this can be reduced with an accurate and complete explanation prior to initiating the test (24). In a series published before, in which we ask for tolerance, women who had previously conducted a multi-channel Urodynamic test, all expressed less discomfort with non-multichannel test (25).

As in the previous series (25), we found a high association of stress urinary incontinence with urethral hypermobility associated with intrinsic sphincter deficiency. Kayigil et al. concludes in a publication that the high number of association of intrinsic sphincter deficiency in patients with urethral hypermobility may explain cases of failure after suspension of the bladder neck (26). In such cases we prefer to use the technique of classic TVT obtaining high percentages of cure.

The Non-multichannel Urodynamic test with the new MoniTorr™ system can make a contribution in the study of women with stress urinary incontinence. If it is compare with the multichannel test we can say that it is more friendly, portable and less invasive. In comparing costs, in our experience, reduces the costs in a third, this may mean less restriction on the time of requiring use a test for the urinary incontinence study.

When we decided not to conduct an Urodynamic in a patient who requires it, this may impact on the proper diagnosis, raising the possibility of failure. If we compare the costs of the failure of the anti-incontinence surgery, naturally will be higher than those of Urodynamic (27). However, as we have stated previously, this cost can be reduced even further with the Non-multichannel Urodynamic test.

CONCLUSIONS

The MoniTorr™ non-multichannel Urodynamic test is an objective method to demonstrate urinary incontinence diagnosed by clinical method.

The Urodynamic is a very useful additional examination in the study of urinary incontinence.

The clinical diagnosis can be different at diagnosis objectified by Urodynamic test.

The urodynamic study allows planning a solution according to the characteristics of each patient.

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