

## MRI URODYNAMICS AS A MORE SENSITIVE METHOD TO DETECT SPHINCTER INSUFFICIENCY IN PATIENTS WITH SUI

### Hypothesis / aims of study

Magnetic resonance imaging (MRI) rapidly becomes a major diagnostic tool in the assessment of anatomic pelvic conditions. The possibility of performing simultaneous urodynamic evaluation and pelvic magnetic resonance imaging may have a potential role for better understanding stress urinary incontinence (SUI). Herein we compare the results of MRI videourodynamics with conventional urodynamics during the Valsalva leak point pressure (VLPP) assessment of urethral sphincter insufficiency in women complaining of SUI.

### Study design, materials and methods

We studied sixteen women with genuine stress urinary incontinence, diagnosed by history and physical examination. Urodynamic examination was performed on multichannel equipment with the patient in the supine position. Cough and Valsalva maneuvers were performed at volumes of 150, 250 and 350 ml. In a second moment, the urodynamic evaluation was performed simultaneously to magnetic resonance imaging which was carried out by using 1.5 T GE Signa CV/i high-speed scanners with real time fluoroscopic imaging possibilities. Fluoroscopic imaging was accomplished in the corresponding planes with T2-weighted single shot fast spin echo sequences at a speed of about one frame per second. Both studies were recorded and synchronized, resulting in a single videourodynamic examination. VLPP were obtained in both situations. The value was considered at the moment of external urine elimination in classical urodynamics exams and at the instant of urethral urinary filling imaging during the MRI urodynamics.

### Results

VLPP were significantly lower at MRI videourodynamics than during conventional urodynamics (average of 96 versus 71cmH<sub>2</sub>O,  $p=0.006$ ). MRI urodynamics detected urinary sphincter insufficiency in all sixteen patients and conventional urodynamics in only eleven ( $p=0.03$ ) (TABLE 1).

Table1: Detection of sphincter insufficiency and urinary leakage under VLPP in 16 women

	Leakage	No Leakage
<b>Convencional Urodynamics</b>	11 (68.7%)	5 (31.3%)
<b>MRI Urodynamics</b>	16 (100%)	0 (0%)

**McNemar test:  $p = 0.031$**

### Interpretation of results

The determination of the VLPP is influenced by several factors like bladder volume, provocative maneuvers, catheter size, position of the patient, and site of pressure measurement (vesical, vagina or rectum). In this study the determination of the VLPP was standardized, except for method of leakage detection (direct visualization in conventional urodynamics exams and at the instant of urethral urinary filling imaging during the MRI urodynamics). The earlier detection of leakage by the MRI urodynamics compared to conventional urodynamics was translated by lower VLPP values. The greater sensitiveness of MRI urodynamics was also evident by the fact that conventional urodynamics failed to diagnose stress incontinence in 5 patients (31.3%) whereas MRI urodynamics detected leakage in all patients.

### Concluding message

The execution of MRI videourodynamics is feasible and seems to be a more sensitive method to detect SUI, with better correlation to the patient complaints. Clinical and surgical significances of this finding are still to be determined.

### **FUNDING:**

**NONE**

### **DISCLOSURES:**

**NONE**

**CLINICAL TRIAL REGISTRATION:** This clinical trial has not yet been registered in a public clinical trials registry.

### **HUMAN SUBJECTS:**

This study was approved by the Comitê de Ética em Pesquisa Hospital São Paulo and followed the Declaration of Helsinki Informed consent was obtained from the patients.