



Effect of Urodynamic Urethral Catheter on Uroflowmetry Parameters: A Prospective Study

Tariq Al-Shaiji¹, Said Yaiesh², Ali Albaghli¹, Ahmed R. El-Nahas¹,
Abdullatif Al-Terki¹

¹ Urology Unit, Al-Amiri Hospital - Kuwait City, Kuwait

² Kuwait Urology Board – Kuwait Institute for Medical Specialization



Introduction

- Urodynamic studies (UDS) are an integral part of assessing voiding symptoms in both genders.
- Its settings and components are points of debate for possible effects on results that sometimes vary from preliminary diagnoses, particularly the urethral or vesical catheters used filling and voiding cystometry and their effect on uroflowmetry (UFM) parameters.

Objective

This study is conducted to investigate the effect of urethral and vesical catheters on UFM parameters.

Patients and Methods

- We prospectively enrolled 150 patients undergoing UDS for established voiding symptoms from January 2016 to March 2018.
- Exclusion criteria were pre-UDS voided volume <150mls and/or inability to void during UDS with catheter in place.
- Biometric data and clinical history were collected.
- Free UFM preceded the UDS. Double-lumen 7F urethral catheter was inserted to measure intra-vesical pressure and for filling and voiding cystometry.
- A single consultant urologist analyzed the UFM and UDS strips.
- Parameters of free UFM were compared with that of voiding cystometry using t-test.

Results

- The study included 105 eligible patients (mean age: 55 years), 54% of them were females.
- Urge urinary incontinence was most frequent form of leak (n=28) and 69% of strips showed detrusor overactivity.
- Statistically significant better results were observed between pre-UDS UFM and pressure-flow UFM for mean values for maximum flow (Qmax) (+4.33ml/s, p<0.001), average flow (+1.95ml/s, p<0.05), voiding time (-16.6s, p<0.001), and time to Qmax (-6.6s, p<0.001), but not post-void residual volume (12.2mls, p=0.16) and percentage PVR of cystometric capacity (0.01%, p=0.7).
- Time to Qmax becomes insignificant when compared among males only (p=0.2), while all PVR assessments become significant among females alone (p<0.05).
- Analysis was repeated including those who voided 120mls or more (n=120) on pre-UDS UFM and yielded results of similar significance.

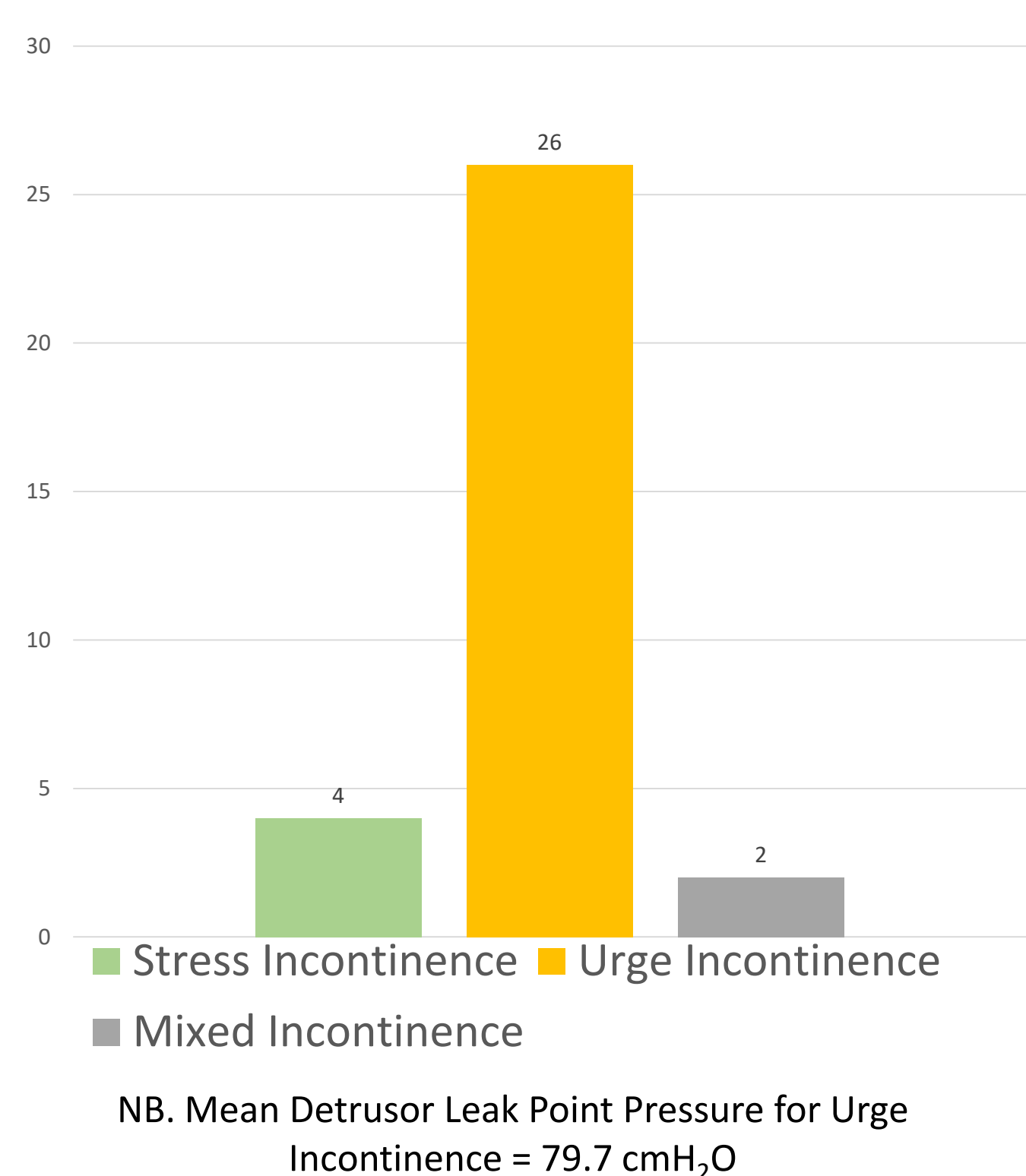
Conclusion

- The insertion of a urethral catheter has a significant effect on UFM parameters in patients regardless of gender. Pre-UDS UFM studies are important to identify such effects that may influence the final diagnosis.
- A larger series is in plan to maximize assessment and discern clinical application of our findings.

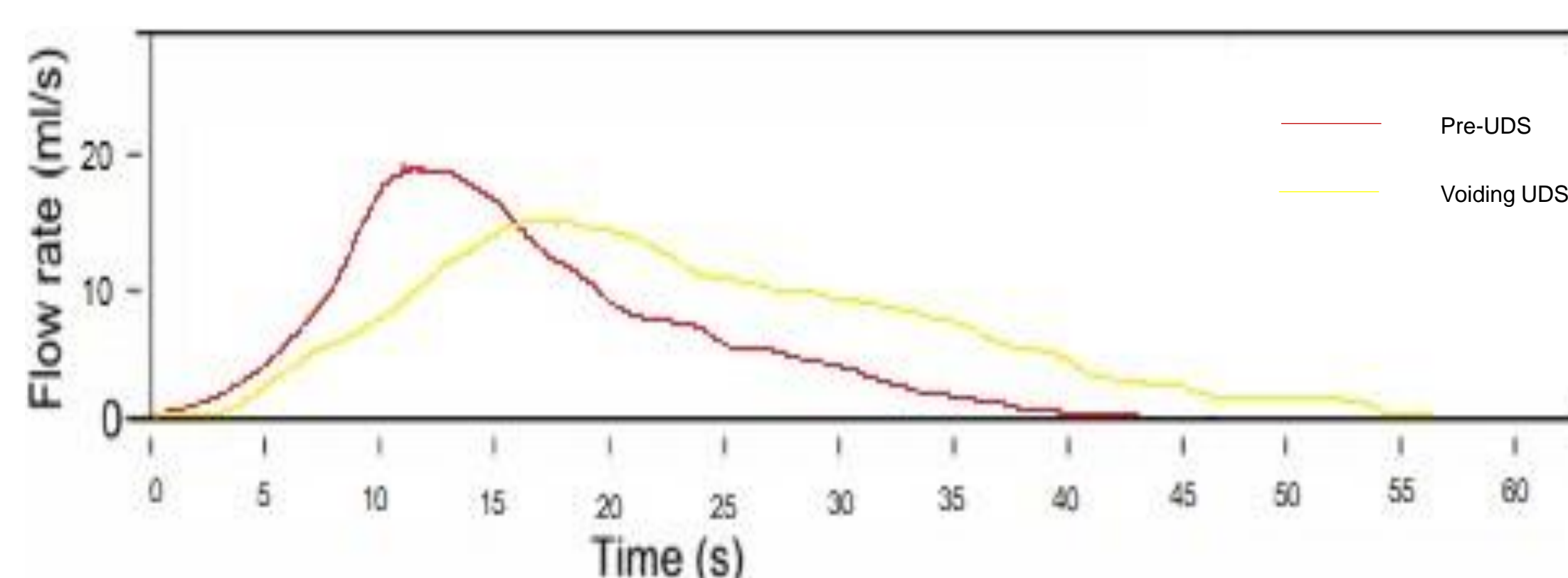
Patient Data Summary

Age	Mean	SD
	55.1	15.2
Gender	Male	Female
	46%	54%
Voiding Flow	Continuous	Interrupted
	84%	16%

Chart: Frequency of Types of Urinary Incontinence in Patients

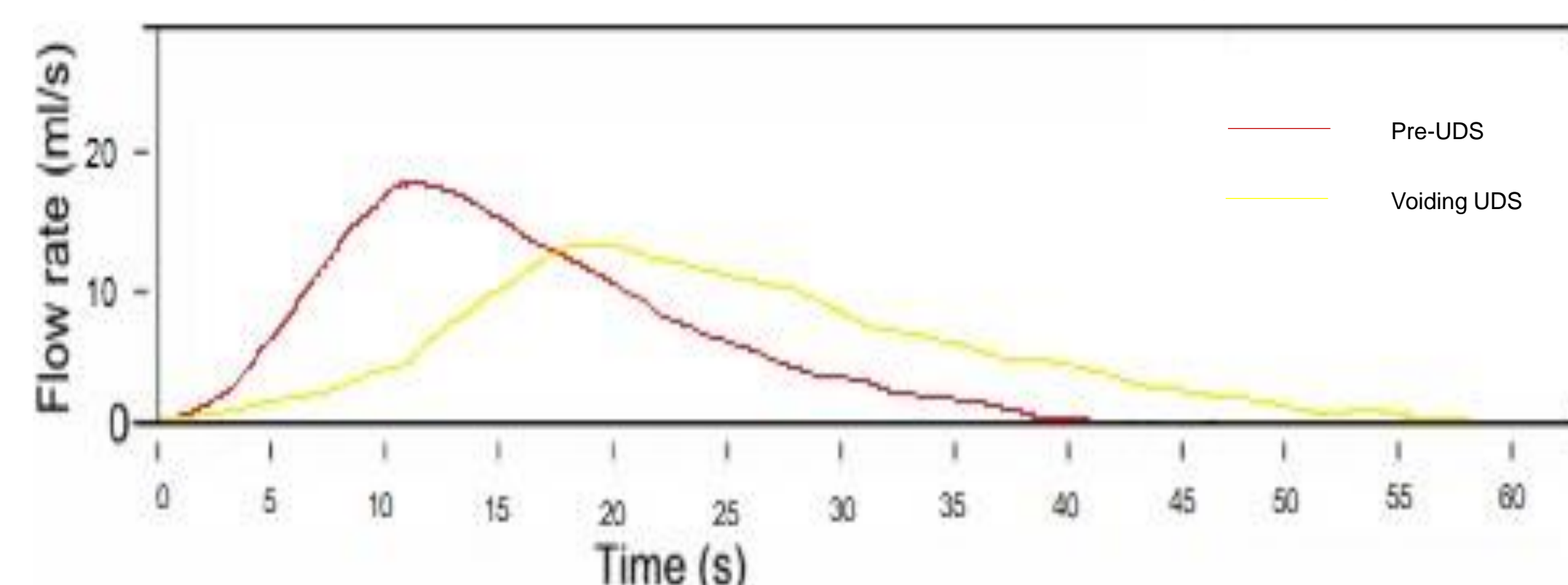


1. Comparison of UFM Parameters Pre-UDS & During UDS For Those Who Have A Pre-UDS Voided Volume 150mls Or More (n=105)



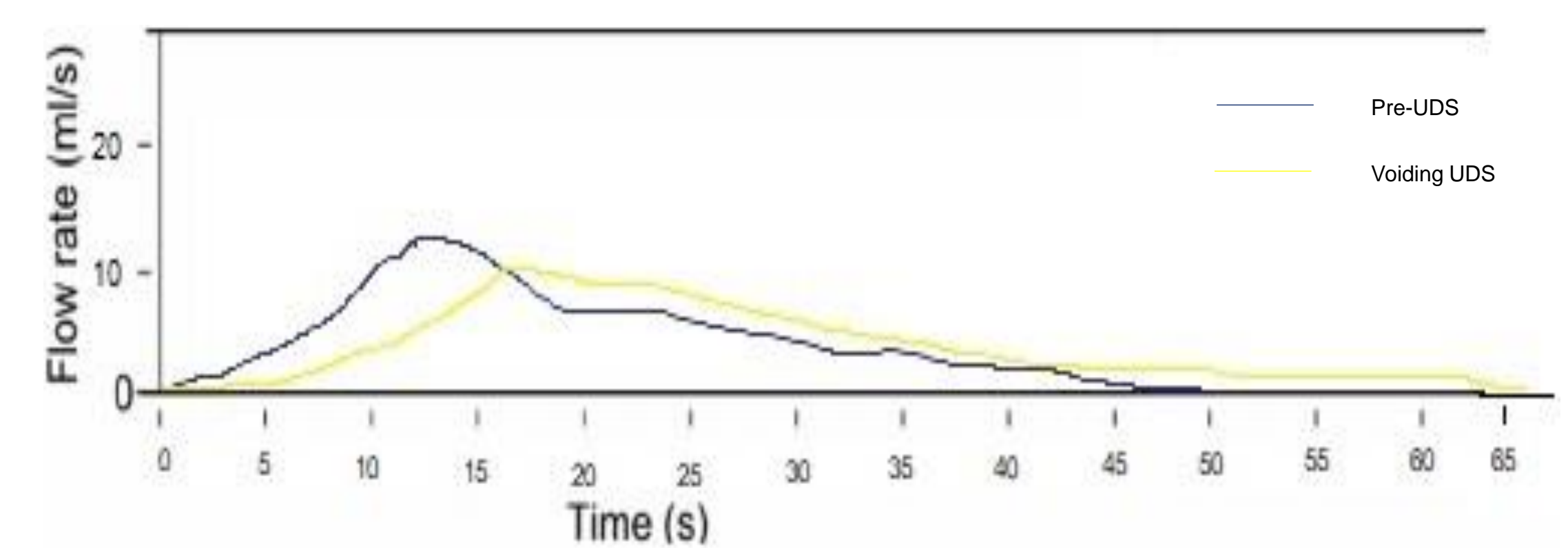
UFM Parameters	Mean +/- Standard Deviation			
	Pre-UDS	Voiding UDS	Difference	P-value
Qmax (ml/s)	19.23±12.66	14.90±9.48	+4.33±8.87	<0.001
Average Flow (ml/s)	8.70±4.61	6.75±3.54	+1.95±4.34	0.01
Time to Qmax (s)	11.19±8.33	17.78±13.05	-6.60±12.81	<0.001
Voiding Time (s)	39.34±16.88	55.90±30.20	-16.56±29.32	<0.001
PVR (mls)	55.50±80.91	43.35±62.15	+12.15±85.50	0.163
% PVR	13.88±14.50	13.33±16.56	0.55±16.62	0.7

2. Comparison of UFM Parameters Pre-UDS & During UDS For Those Who Have A Pre-UDS Voided Volume 120mls Or More (n=120)



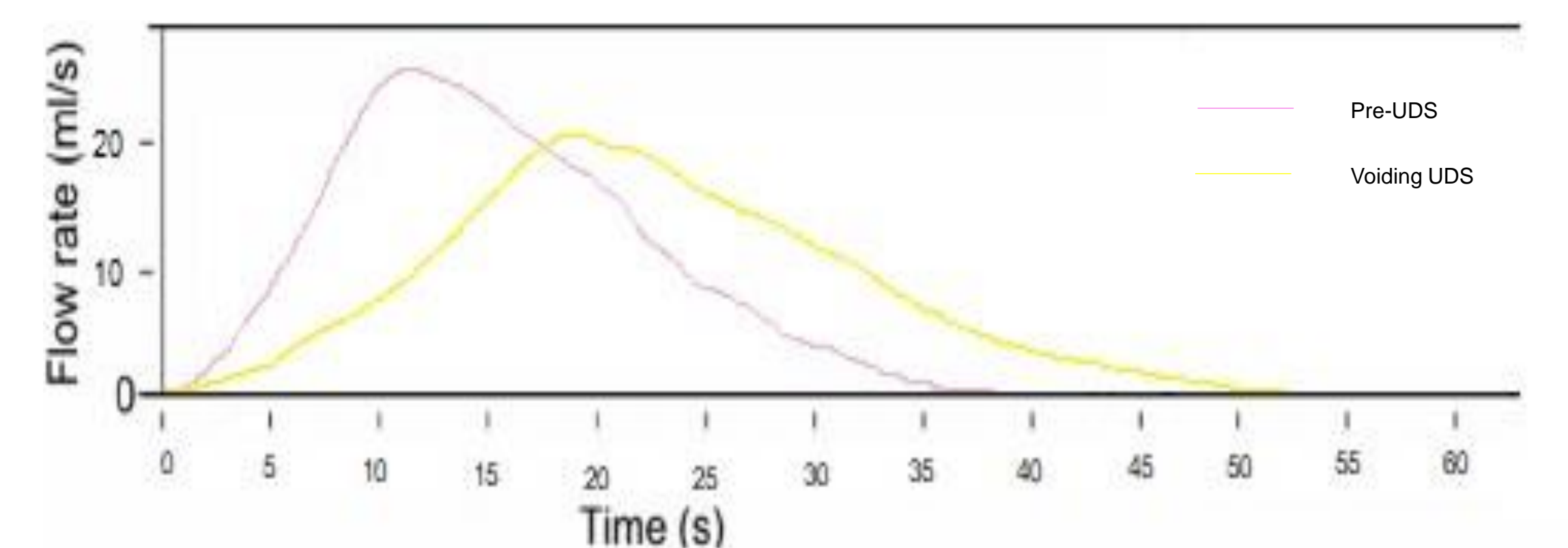
UFM Parameters	Mean +/- Standard Deviation			
	Pre-UDS	Voiding UDS	Difference	P-value
Qmax (ml/s)	18.17±12.29	14.12±9.38	+4.05±8.42	<0.001
Average Flow (ml/s)	8.25±4.54	6.50±3.52	+1.75±4.16	<0.01
Time to Qmax (s)	10.93±7.96	17.87±12.35	-6.94±12.43	<0.001
Voiding Time (s)	38.09±16.92	55.51±29.60	-17.42±28.58	<0.001
PVR (mls)	56.09±78.90	47.00±66.64	+9.09±88.61	0.278
% PVR	16.47±17.00	15.07±18.08	1.40±19.75	0.434

3. Comparison of UFM Parameters Pre-UDS & During UDS For Males Who Have A Pre-UDS Voided Volume 150mls Or More (n=48)



UFM Parameters	Mean +/- Standard Deviation			
	Pre-UDS	Voiding UDS	Difference	P-value
Qmax (ml/s)	12.41±8.72	9.31±6.03	+3.10±8.05	0.01
Average Flow (ml/s)	7.17±4.12	5.80±3.66	+1.37±1.60	0.02
Time to Qmax (s)	12.46±8.10	16.47±9.52	-4.01±13.25	0.216
Voiding Time (s)	45.64±17.68	66.00±33.41	-20.35±32.85	0.004
PVR (mls)	65.11±94.25	68.18±72.33	-3.07±98.04	0.835
% PVR	16.63±17.55	20.95±18.42	4.32±20.58	0.166

4. Comparison of UFM Parameters Pre-UDS & During UDS For Females Who Have A Pre-UDS Voided Volume 150mls Or More (n=57)



UFM Parameters	Mean +/- Standard Deviation			
	Pre-UDS	Voiding UDS	Difference	P-value
Qmax (ml/s)	24.97±12.67	19.62±9.34	+5.35±9.45	<0.001
Average Flow (ml/s)	9.26±4.73	7.10±3.50	+2.16±5.00	0.03
Time to Qmax (s)	10.55±8.48	17.78±13.05	-7.89±12.56	0.001
Voiding Time (s)	35.44±15.31	49.65±26.56	-14.22±27.06	0.001
PVR (mls)	47.34±67.43	22.26±42.32	+25.08±71.65	0.01
% PVR	11.51±10.84	6.73±11.31	4.78±10.75	0.002

Summary of UDS Findings	No. of Patients
Detrusor Overactivity	68.6% (n=72)
Detrusor Underactivity	0.1% (n=1)
Detrusor Sphincter Dyssynergia	2.0% (n=2)
Bladder Outlet Obstruction	24.8% (n=26)