

Treatment Outcome of Intravesical Platelet Rich Plasma Injections In Patients with Interstitial Cystitis/Bladder Pain Syndrome

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Aim of study

Interstitial cystitis/bladder pain syndrome (IC/BPS) has two subtypes: Hunner (HIC) and non-Hunner-type IC (NHIC). The pathogenesis of IC/BPS is unclear. This study aimed to determine the clinical efficacy of intravesical PRP injections in a large IC/ BPS patient cohort and explored the predictor for satisfactory outcomes in patients with IC/BPS.

Study design and Methods

- ◆ 98 NHIC/BPS patients was included between 2016/01 and 2023/10
- ◆ 10 ml PRP , made from 50ml whole blood, was injected into 20 sites of suburothelium
- ◆ Cystoscopic hydrodistention : determine Maximum bladder capacity and glomerulation grade
- ◆ Primary endpoint: self-reported GRA score 3 months after the fourth PRP injection
- ◆ Satisfactory outcome group: GRA ≥ 2

Result and Interpretation

	Baseline	3 rd PRP	3M after 4 th PRP
Age (years)	54.3±12.3		
Gender			
Male	16 (16.3%)		
Female	82 (83.6%)		
IC duration (years)	12.6±9.99		
Videourodynamic study parameters			
First filling sensation	128.1±53.4		
Full sensation	203.4±84.5		
Pdet.Qmax	22.3±14.8		
Cystometric bladder capacity	260.1±114.2		
IC symptoms index	10.8±4.43	7.43±4.02 [§]	6.91±4.04 [*]
IC problem index	10.6±3.38	7.4±3.86 [§]	7.21±3.94 [*]
Bladder pain severity (NRS)	3.78±3.08	2.15±2.44 [§]	2.02±2.47 [*]
3-days voided diary			
Frequency	13.9±8.9	12.4±10.4 [§]	11.2±5.49 [*]
Nocturia	3.09±1.87	2.18±1.41 [§]	2.08±1.49 [*]
Functional bladder capacity	267.6±129.3	311.4±133.0 [§]	322.0±121.0 [*]
Anxiety severity of BAI	22.4±12.3	16.9±10.5 [§]	17.4±9.83 [*]
Uroflowmetry			
Maximum flow rate	10.9±6.5	15.8±9.5 [§]	18.4±10.7 [*]
Voided volume	205.2±110.7	212.0±112.9 [§]	233.2±114.1 [*]
Post-void residual	46.4±107.1	31.6±72.0 [§]	24.9±53.6

Significant improvements were observed in ICSI, ICPI, NRS, urination frequency, nocturia, functional bladder capacity (FBC), anxiety severity, maximum flow rate (Qmax), and voided volume, without an increase in post-voided residual urine (PVR) compared to baseline .

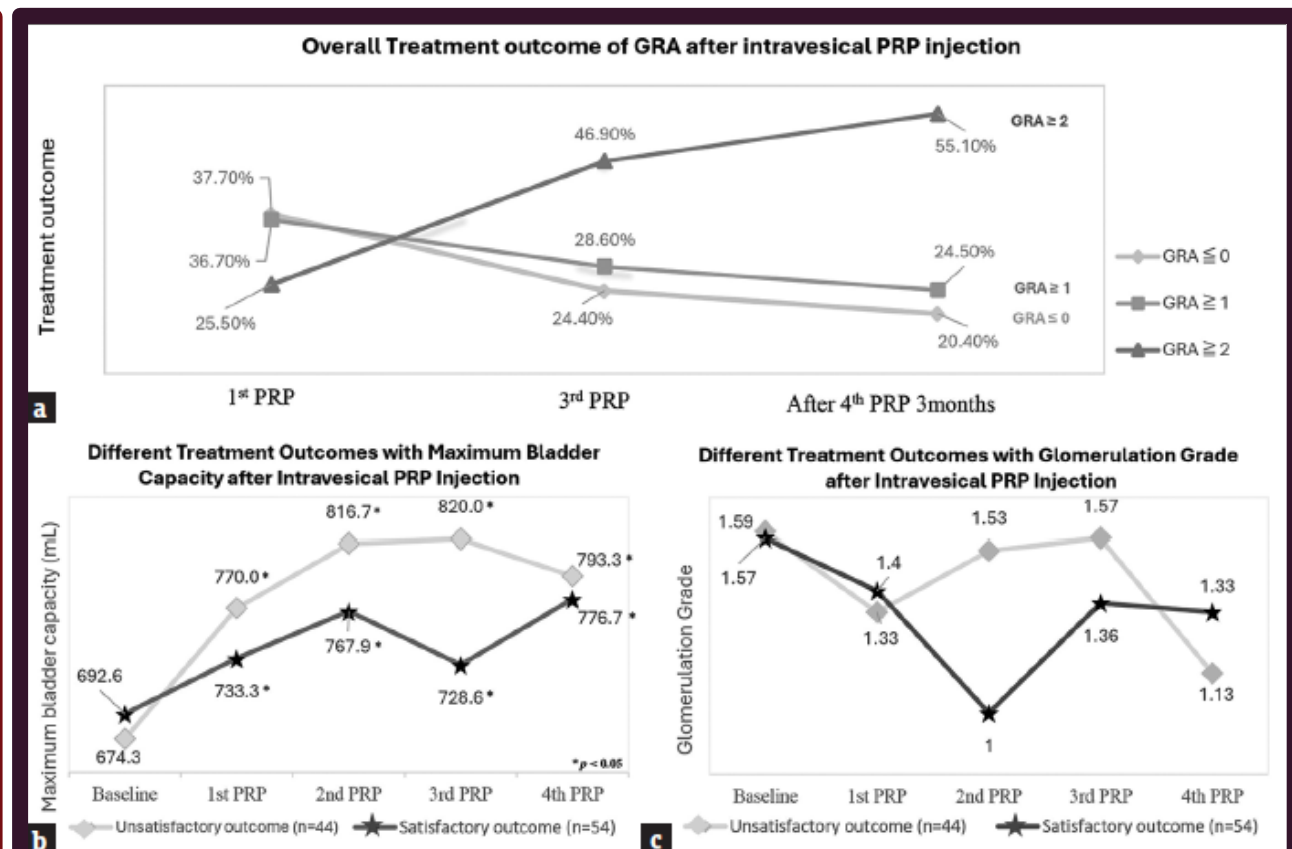
	Unsatisfactory outcome (GRA <2) (n=44)	Satisfactory outcome (GRA ≥2) (n=54)	P
Age	53.0±11.9	54.0±12.1	0.698
Gender, n (%)			
Male	6 (13.6)	10 (18.5)	0.515
Female	38 (86.4)	44 (81.5)	
IC duration	12.8±8.52	12.6±11.5	0.930
ICSI			
Baseline	11.1±4.7	10.6±4.19	0.613
Δ6 months	-2.72±4.53 [§]	-4.87±4.38 [§]	0.020 [*]
ICPI			
Baseline	10.7±4.41	10.5±3.38	0.743
Δ6 months	-2.47±3.95 [§]	-4.12±4.1 [§]	0.049 [*]
Bladder pain severity (NRS)			
Baseline	3.73±3.09	3.81±3.02	0.888
Δ6 months	-1.22±2.34 [§]	-2.18±2.7 [§]	0.067
3-day voided diary - frequency			
Baseline	16.0±11.3	12.1±5.9	0.031 [*]
Δ6 months	-2.71±6.17 [§]	-1.67±5.0 [§]	0.337
3-day voided diary - nocturia			
Baseline	3.36±2.09	2.87±1.66	0.199
Δ6 months	-1.34±1.52 [§]	-0.8±1.73 [§]	0.146
3-day voided diary - FBC			
Baseline	232.8±125.9	296.5±126.0	0.015 [*]
Δ6 months	73.3±152.9 [§]	18.1±110.3 [§]	0.086
Bladder computer tomography, n (%)			
Smooth bladder wall	9 (56.3)	13 (54.2)	0.897
Focal thickness	7 (43.8)	11 (45.8)	
Anxiety severity of BAI			
Baseline	21.7±13.2	22.9±11.7	0.712
Δ6 months	-3.57±11.9 [§]	-4.77±11.3 [§]	0.707

Satisfactory outcome group had a lower baseline urinary frequency and greater FBC.

Significant improvement was observed in both group.

	Unsatisfactory outcome (n=44)	Satisfactory outcome (n=54)	P	Control* (n=31)	PRP versus control (P)
IL-8	10.14±12.48	16.87±24.41	0.086	12.44±20.97	0.737
IP10	13.34±26.93	14.47±31.28	0.835	13.81±18.42	0.978
MCP1	335.08±337.73	347.8±635.21	0.907	147.13±109.73	0.001 [*]
NGF	0.17±0.02	0.17±0.02	0.930	0.26±0.07	<0.001 [*]
BDNF	0.52±0.11	0.54±0.13	0.415	0.54±0.11	0.661
Exotoxin	7.67±8.47	8.91±9.04	0.495	4.97±3.7	0.042 [*]
IL-2	0.22±0.08	0.21±0.12	0.727	0.8±0.18	<0.001 [*]
IL-6	15.75±92.07	2.05±3.24	0.281	1.29±1.35	0.551
MIP1β	1.42±2.33	1.44±2.09	0.983	2.52±1.81	0.017 [*]
RANTES	5.86±7.3	4.93±6.3	0.506	6.04±5.15	0.609
TNF-α	1.5±0.45	1.52±0.36	0.869	0.81±0.32	<0.001 [*]
PGE2	308.79±263.89	310.93±221.43	0.966	161.37±105.15	<0.001 [*]
8-OHdG	32.36±24.04	37.25±24.13	0.328	18±13.73	<0.001 [*]
8-isoprostane	54.4±50.76	58.11±75.57	0.785	16.78±11.74	<0.001 [*]
TAC	1670.58±1525.4	1510.51±1721.14	0.637	1077.91±925	0.110

Significantly higher levels of inflammatory cytokines and oxidative stress biomarkers and lower levels of nerve growth factor, interleukin-2, and macrophage inflammatory protein-1 beta were observed in IC/BPS patients compared to controls. However, baseline urine biomarkers did not significantly differ between IC/BPS patients with different treatment outcomes.



The percentage of satisfactory outcome increased from 25.5% after the first PRP injection to 55.1% at the study endpoint. However, the glomerulation grade only slightly improved.

Conclusion

- ◆ Regardless of whether the outcome was satisfactory, all patients showed improvements in urinary frequency episodes and pain and an increase in MBC after PRP treatment
- ◆ Repeated PRP injections are safe and effective for reducing urinary symptoms and pain and improving bladder capacity in majority of IC/BPS patients
- ◆ Our results support further research on PRP as a promising novel therapy for this challenging bladder condition.