

The number of factors for metabolic syndrome are the risk factors for de novo OAB after pelvic organ prolapse repair

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ABSTRACT

Aims: The aim of this study was to search the risk factors of Overactive bladder (OAB) symptom after Pelvic organ prolapse (POP) repair. We also tried to examine the mechanism of OAB induced by POP.

Methods: A total of 106 patients with POP who underwent POP repair in our hospital were included and retrospectively analyzed. Each women had a urinalysis, pelvic examination, urodynamic study, MRI and answered urinary questionnaires. OAB was defined by OAB symptom score (OABSS), and POP severity was classified by POP Quantification. They were divided into clinically preoperative OAB group (n=47) and non OAB group (n=59). Factors correlated with OAB symptoms improvement after POP repair surgery were examined to elucidate the cause of OAB onset in POP patients.

Results: In 59 pre-operative non OAB patients, OAB symptoms were detected after surgical treatment (de novo OAB) in 5 cases (8.4%). There were significant correlation between de novo OAB and metabolic syndrome (Mets) factors.

Conclusions: The number of factors for metabolic syndrome was correlated to de novo OAB after pelvic organ prolapse repair. In the Mets group, arteriosclerosis of the bladder was significantly progressed. In Mets patients, originally delicate bladder was thought to cause de novo OAB due to surgical damage. It seems that there is a possibility of preventing de novo OAB after POP repair surgery by proactively intervention of treatment for metabolic syndrome.

METHODS

Risk factors and histological examination of de novo OAB after POP repair

1.Risk factors of de novo OAB after POP repair

Of 109 patients who underwent POP repair surgery in our hospital, 59 patients who did not have OAB symptoms before surgery were included.

Patient characteristics, comorbidities, POP characteristics, urodynamic study's result were analyzed in 54 patients without OAB and 5 patients with de novo OAB.

POP patients without OAB (n=59)

POP repair

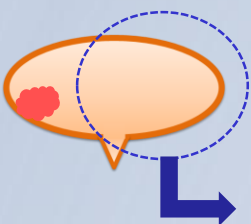
without OAB after surgery (n=54)

de novo OAB (n=5)

2.Histological analysis using bladder tissue

To investigate the causal relationship between POP repair and OAB anatomically, we studied the bladder tissue. Especially the bladder nerve and vasculature were evaluated histologically.

Among patients who underwent total cystectomy with bladder cancer diagnosis at our hospital, we used bladder tissue not undergoing neoadjuvant-chemotherapy before surgery.



Bladder tissues from total cystectomy without neoadjuvant-chemotherapy

Investigation using normal bladder tissue with a margin of 2 cm or more from tumor

Statistical analysis

Data analysis was performed using the Student t-test, Mann-Whitney U-test IBM SPSS ver 24.0 and p-value less than 0.05 was considered statistically significant. The odds ratio was calculated by the χ^2 test.

RESULTS

1.Risk factors of de novo OAB after POP repair

factors	P values	factors	P values
Age	0.966	BCI	0.391
BMI	0.009	BOOI	0.308
Hypertension	0.017	ISD	0.242
Diabetes mellitus	0.003	POP characteristics	
Hyper-lipidemia	0.077	POP stage	0.812
Mets 1 factor	0.176	POP stage>3	0.671
Mets 2 factors	0.002	Paravaginal defect	0.895
Mets 3 factors	<0.001	Blaivas classification	0.896
Mets 4 factors	<0.001	Q tip test	0.312

Odds ratio of each factors

factors	OR	P value	95%CI
Mets 1 factor			
HT	10.4	0.03	1.07-100.74
DM	12.0	0.02	1.65-86.94
HL	6.3	0.15	0.66-60.15
Mets 2 factors	10.0	0.03	1.42-71.32
Mets 3 factors	79.5	<0.01	5.51-1145.08

2.Histological analysis using bladder tissue

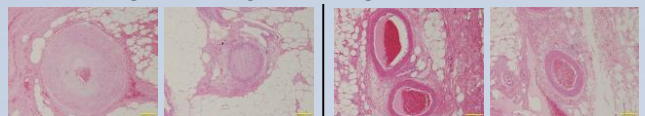


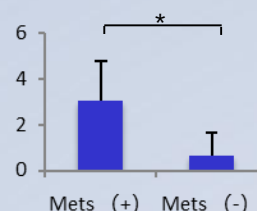
Figure1:

Figure2:

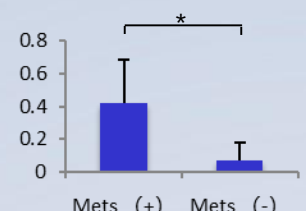
We examined arteriosclerotic changes of the bladder small arterioles.

Fig.1 are the typical arteriosclerosis seen in METS patients, and Fig.2 are normal bladder small artery.

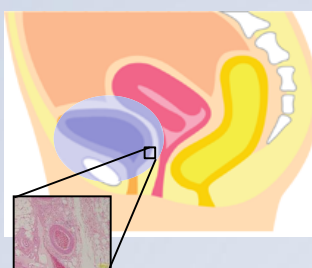
Numbers of arteriosclerosis



Ratio of arteriosclerosis



CONCLUSIONS



Metabolic syndrome

Arteriosclerosis

Bladder ischemia

Surgical damage

In Mets patients, originally delicate bladder were thought to cause de novo OAB due to surgical damage.

There is a possibility that de novo OAB can be prevented by therapeutic intervention of Mets.

REFERENCES

- Saratlija Novakovic Z, Tesija RA, Puljak L. Scand J Urol. 2017
Zacche MM, Giarenis I, Thiagamoorthy G, Robinson D, Cardozo L. Eur J Obstet Gynecol Reprod Biol. 2017
He Q, Wang Z, Liu G, Daneshgari F, MacLennan GT, Gupta S. Prostate Cancer Prostatic Dis. 2016