4. Metabolism and Endocrine Diseases

References

Takagi S. Mitigation of hyponatremia after operation for cholelithiasis or gallbladder polyp by preoperative administration of wu-ling-san. *Saitama Ikadaigaku Zasshi* (*Journal of Saitama Medical School*) 1990; 17: 145-50 (in Japanese with English abstract).

Seki M, Fujioka M, Hatano T, et al. Analysis of regulatory effects of gorei-san on circulatory, metabolic and diuretic function - especially in relation to endothelial activation and increase of urinary 6-keto-prostaglandin $F_{1\alpha}$ level-. *Nihon Toyo Igaku Zasshi* (*Japanese Journal of Oriental Medicine*) 1992; 42: 313-22 (in Japanese with English abstract).

1. Objectives

To evaluate the efficacy and safety of goreisan (五苓散) in the treatment of postoperative hyponatremia for cholelithiasis or gallbladder polyps.

2. Design

Randomized controlled trial (RCT).

3. Setting

A university hospital (Saitama Medical University Hospital), Japan.

4. Participants

Fifty-eight females undergoing surgery for cholelithiasis or gallbladder polyps (without evidence of inflammation).

5. Intervention

Arm 1: administration of TSUMURA Goreisan (五苓散) Extract Granules 2.5 g t.i.d. on an empty stomach for a mean treatment duration of 7.9 days before surgery (n=17).

Arm 2: administration of TSUMURA Shosaikoto (小柴胡湯) Extract Granules 2.5 g t.i.d. on an empty stomach for a mean treatment duration of 6.3 days before surgery (n=13).

Arm 3: control group, bed rest in the hospital (n=28).

6. Main outcome measures

Morning fasting levels of blood sodium (Na), potassium (K), and chloride (Cl), white blood cell, red blood cell, and platelet counts, 24-hour urinary prostaglandin (PGE1), and 24-hour urinary excretion of 6-keto prostaglandin F1 alpha (6-keto-PGF1α) were assessed beginning before administration to 14 days after surgery.

Blood urea nitrogen (BUN) was also measured in the related article indicated below.

7. Main results

At postoperative days 0 and 1, blood sodium (Na) but not K and Cl was higher in Arm 1 than in Arms 2 and 3. There was no among-group difference in white blood cell count, whereas at postoperative days 8–14, red blood cell count was lower in Arm 1 than in Arm 3, and at postoperative day 1, platelet count was higher in Arms 1 and 2 than in Arm 3. There was no among-group difference in PGE1. But 6-keto-PGF1α increased significantly in only Arm 1 for up to 14 days after surgery.

8. Conclusions

In patients planned for gallbladder surgery, preoperative administration of goreisan significantly increased postoperative urinary PGF1α and urine output. In addition, postoperative hyponatremia was mitigated and associated with a shorter duration.

9. From Kampo medicine perspective

No significant among-group difference was observed in the number of patients with *netsu-sho* (熱証, heat pattern) or *kan-syo* (寒証, cold pattern) according to Kampo diagnosis.

10. Safety assessment in the article

Goreisan has no adverse effects, according to the related article indicated below.

11. Abstractor's comments

The interim report of this study described the effect of preoperative administration of goreisan on edema in patients planned for gallbladder surgery. This study further examined that effect in terms of its mechanism. Notably, the diuretic effect of preoperatively administered goreisan persisted after surgery. The authors speculate that this effect was caused by increased production of PGI2 (associated with an increase in urine PGF1α, a 6-keto-PGI2 metabolite), which in turn resulted in renal vasodilatation and the anti-ADH effect of 6-keto-PGF1α leading to increased diuresis. Therefore, the administration before common elective surgery (not just gallbladder surgery) may result in significant increase of urine volume or reduced postoperative hyponatremia, as well as shorten duration of hospitalization. Further evaluation of goreisan may expand its applicability to other surgeries in the future.

The article by Takagi (1990) is the interim report of the article by Seki et al (1992).

12. Abstractor and date

Namiki T, 29 December 2008, 6 January 2010, 1 June 2010, 31 December 2013.