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ORIGINAL ARTICLE

Risk factors for systemic inflammatory response syndrome after percutaneous nephrolithotomy

Facteurs de risque du syndrome de réponse inflammatoire systémique après néphrolithotomie percutanée

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KEYWORDS

PCNL;
SIRS;
Risk factor;
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Summary

Objectives. – To explore the risk factors for systemic inflammatory response syndrome (SIRS) after percutaneous nephrolithotomy (PCNL).

Methods. – A retrospective chart review was performed to identify 1030 patients who had undergone PCNL from January 2014 to July 2016 in the Minimally Invasive Surgery Center. Multiple data, including age, sex, body mass index (BMI), operation time, Staghorn calculi, diabetes, Serum creatinine, preoperative urine culture and the urinary sediment microscopy white blood cell (WBC) were collected. These factors and postoperative SIRS were retrospectively analyzed.

Results. – There were 108 cases (10.49%) of SIRS among 1030 patients. The results of univariate analysis showed that sex ($P=0.015$), Staghorn calculi ($P<0.001$), preoperative urinary culture of Gram-negative bacteria ($P<0.001$) and preoperative urinary sediment microscopy WBC (+, ++, +++, +++) ($P<0.001$, $P<0.001$, $P=0.009$, $P=0.045$) were correlated with postoperative SIRS ($P<0.05$). According to Multivariate analysis results, the likelihood of SIRS after PCNL increased with Staghorn calculi ($P=0.01$, OR = 10.457, 95% CI = 1.312–3.092), the urinary sediment microscopy WBC (+~++++) ($P<0.001$, OR = 2.591, 95% CI = 1.661–4.042) and positive urine culture for Gram-negative bacteria ($P<0.001$, OR = 3.550, 95% CI = 2.205–5.715).

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Conclusions. – Staghorn calculi, the urinary sediment microscopy WBC and positive urine culture for Gram-negative bacteria are independent risk factors for SIRS. Patients affected by these risk factors should receive careful anti-infectious perioperative management for prevention of postoperative SIRS.

Level of incidence. – 4.

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MOTS CLÉS

PCNL ;
SIRS ;
Facteur de risque ;
Microscopie
préopératoire des
sédiments urinaires ;
WBC

Résumé

Objectifs. – Explorer les facteurs de risque du syndrome de la réponse inflammatoire systémique (SIRS) après néphrolithotomie percutanée (NLPC).

Méthodes. – Une revue rétrospective des dossiers a été réalisée pour identifier 1030 patients ayant subi une NLPC de janvier 2014 à juillet 2016 dans un service. Des données multiples, y compris l'âge, le sexe, l'indice de masse corporelle (IMC), le temps opératoire, la présence d'un calcul coralliforme, le diabète, créatininémie, l'ECBU préopératoire et les globules blancs dans l'urine ont été recueillies. Ces facteurs et les SIRS postopératoires ont été analysés rétrospectivement.

Résultats. – Il y a eu 108 cas (10,49 %) de SIRS chez 1030 patients. Les résultats de l'analyse univariée ont montré que le sexe ($p=0,015$), les calculs coralliformes ($p<0,001$), un ECBU positif à Bacilles Gram négatif ($p<0,001$) et la microscopie préopératoire des globules blancs urinaires (+, ++, +++, +++) ($p<0,001$, $p<0,001$, $p=0,009$, $p=0,045$) ont été corrélés avec le SIRS postopératoire ($p<0,05$). Selon les résultats de l'analyse multivariée, la probabilité de SIRS après NLPC a augmenté avec des la présence d'un calcul coralliforme ($p=0,01$, OR=10,457, IC 95 % = 1,312–3,092), la microscopie des sédiments urinaires WBC (+~++++) ($p<0,001$, OR=2,591, IC à 95 % = 1,661–4,042) et culture d'urine positive pour les bactéries à Gram négatif ($p<0,001$, OR=3,550, IC à 95 % = 2,205–5,715).

Conclusions. – la présence d'un calcul coralliforme, la présence de globules blancs dans l'urine et la culture d'urine positive pour les bactéries Gram négatives sont des facteurs de risque indépendants pour le SIRS. Les patients affectés par ces facteurs de risque devraient recevoir une gestion périopératoire prudente anti-infectieuse pour la prévention des SIRS postopératoires.

Niveau de preuve. – 4.

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Introduction

Urinary stone is one of the common diseases in the Department of urology. It has been reported that the prevalence of urinary stones is about 5–15% and its recurrence rates after 10 years up to 50% [1,2]. The incidence of urinary stone is constantly increasing in industrialized countries and the prevalence of urinary stone was 10% in France [3]. Percutaneous nephrolithotomy (PCNL) is the main method of removing renal calculi, particularly for the patients with burden of large or complex stones. Because of the small trauma, quick recovery and a higher rate of stone clearance, PCNL has become the first choice for treatment of complicated upper urinary tract calculi. However, relatively higher postoperative complication rates were also reported. Systemic inflammatory response syndrome is one of the frequent complications after PCNL. If not well controlled in time, Systemic inflammatory response syndrome can be further developed into a source of urinary sepsis, and even lead to multiple organ dysfunction syndrome (MODS), which

may threaten the lives of patients. The postoperative SIRS is associated with several preoperative risk factors such as operative time, Staghorn calculi and diabetes [4]. The Staghorn calculi are stones that occupy renal pelvis and branch into several or all of the calices [5]. However, there are few reports about the correlation between the urinary sediment microscopy WBC and SIRS after the PCNL.

In this study, our objective was to evaluate the association between urinary sediment microscopy WBC and postoperative SIRS.

Patients and methods

Patients

In this retrospective study, all patients with renal calculi or upper urethral calculi that had undergone PCNL from January 2014 to July 2016 in the Minimally Invasive Surgery Center (First Affiliated hospital of Guangzhou Medical

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