

Study of culture and sensitivity of renal stone culture

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Abstract

Renal stones are quite commonly encountered in this part of the world and are also associated with complications. The tremendous loss of work hours by this disease is seriously impairing the work hours as working young population is often hit with this disease. The demography is never recorded in India but the demography of the western world is available. It is understood that the stones that are encountered are the tombstones of the bacterias in majority of times. Million Dollar question is whether the infection preceeds the stone formation or is a consequence of the same. A number of reasons contribute for the stone formation as previously recorded by different authors. Approximately 10% of people will have a urinary stone during their lifetime. This study puts in an effort to find the culture and sensitivity of renal stone.

Keywords: Culture, sensitivity, renal stone

Introduction

Renal stones are quite commonly encountered in this part of the world and are also associated with complications^[1]. The tremendous loss of work hours by this disease is seriously impairing the work hours as working young population is often hit with this disease^[2]. The demography is never recorded in India but the demography of the western world is available^[3, 4]. It is understood that the stones that are encountered are the tombstones of the bacterias in majority of times. Million Dollar question is whether the infection preceeds the stone formation or is a consequence of the same. A number of reasons contribute for the stone formation as previously recorded by different authors^[5, 6]. Approximately 10% of people will have a urinary stone during their lifetime^[7]. The United States health care burden from renal calculi disease is immense with 185,000 hospitalizations, 2 million outpatient visits and 2.1 billion dollars expended annually for management^[8, 9, 10]. Historically, a key component in urinary stone formation is supersaturation, a process by which the concentration of substances in urine, such as calcium and oxalate, exceed the limits of their solubility^[11]. However, considerable overlap in urine chemistries exists between individuals with and without renal calculi disease^[12, 13, 14]. Furthermore, supersaturation with calcium oxalate (CaOx) or calcium phosphate (CaPhos) is not different in recurrent renal calculi disease patients compared to controls^[15]. Thus, although supersaturated urine is a risk factor, alone it is insufficient for stone formation. This conclusion is supported by the knowledge that treatment with dietary modifications, increased fluid intake, citrate salts and/or thiazide diuretics to reduce urine CaOx supersaturation only moderately improves recurrence rates^[16, 17, 18]. Despite these treatment strategies, renal calculi disease prevalence in US adults and children has recently

increased by 40% and 23%, respectively^[19, 20]. This study puts in an effort to find the culture and sensitivity of renal stone.

Aims and Objectives

To Study the culture and sensitivity of renal stone.

Materials and Methods

Study design

A Prospective Study.

Study period

January 2021-September 2021.

Study setting

Department of Microbiology which procured stones from the Department of Urology.

Study population

All patients presented to our centre and underwent Percutaneous Nephrolithotomy.

Study group

Patients clinically and radiologically diagnosed with renal stone

Inclusion criteria

- All patient admitted who underwent P.C.N.L.
- Patients giving consent for the study.

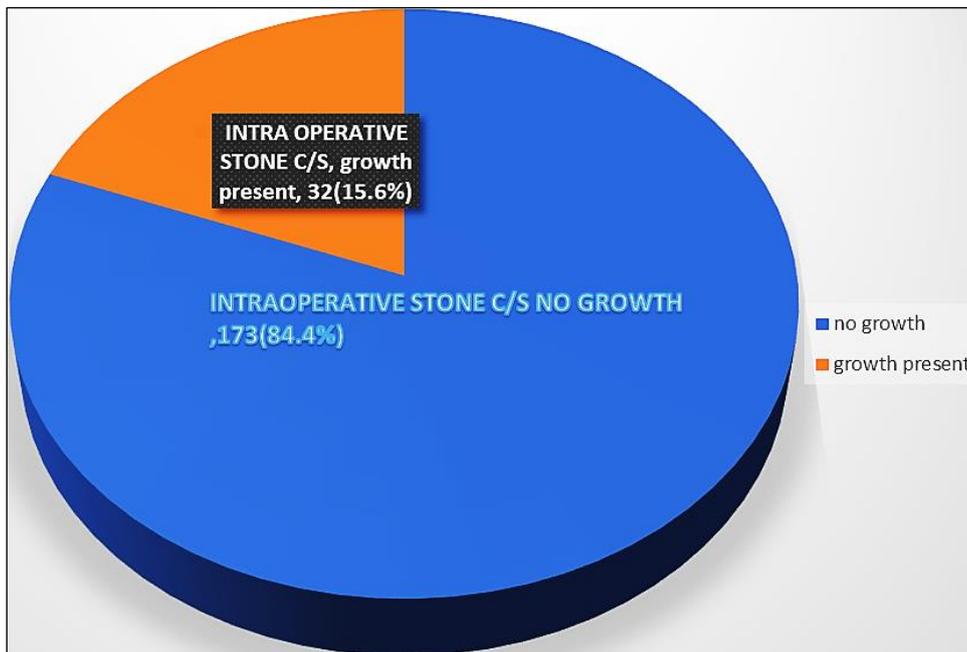
Exclusion criteria

- Pre-operative urine culture shows growth.
- Staged PCNL.
- Patient with serum creatinine more than 2.0 mg%.
- Patient already on antibiotic treatment.

Method

Informed consent is taken. Patient information-Detailed patient information and history are obtained. Routine Pre-operative urine culture and sensitivity is done as a workup for calculus on OPD basis. First dose of antibiotic given at the time of induction of anaesthesia [Ceftriaxone (3rd generation cephalosporins) 1 gm i.v. ATD]. Fragments of Stone obtained during PCNL are send for culture and sensitivity.

Results



Graph 1: Intra Operative stone C/S

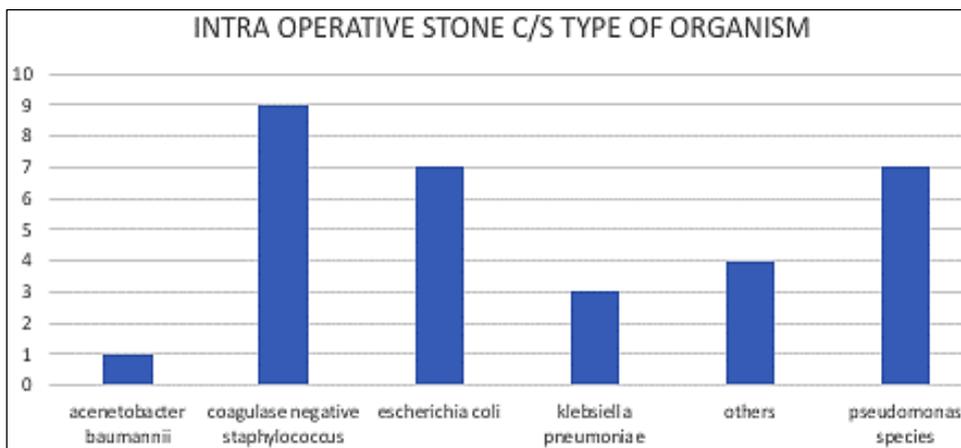


Fig 1: Intra Operative Renal Stone C/S Organism Type

Table 1: Renal stone culture sensitivity in the present study

Antibiotics	Organism													
	P	C	E	EC	PV	AB	EA	K	A	CK	CNS	ECS	SA	MRSA
Amikacin	8			3		1	2	3						
Gentamycin	6			4		1		3			8		2	
Colistin														
Ceftazidime	2							2					1	
Ciprofloxacin	2			1				3			9		1	
Norfloxacin								1						
Levofloxacin	4			1				3			5			
Trimethoprim/Sulfamethoxazole	2										3			1
Piperacillin/Tozabactam	2					1	2	2						
Tigecycline				1			1				1		1	
Cefta						1					1			
Amoxiclav				1										
Doripenem	4			3			1	1					1	
Meropenem	4			3			3	4					1	
Clindamycin											2			
Linezolid											7		1	1

Teicoplanin										4			1
Vancomycin										3			1
Tetracycline										3			1
Ceftazidime	1							2					
Cefexime				1				2					
Cefoperazone/Sulbactam	1							2	2				
Cefepime	2			1				2					
ceftazidime								2					
Cefoxitin										3			
Cotrimoxazole										2		1	
Ampicillin/Sulbactam							1						
Doxycyclin										4		1	
Vancomycin										1			
Erythromycin										1			

Discussion

Identification of other factors that contribute to CaOx and/or CaPhos stone formation (lithogenesis) is a critical need. The bacterial contribution to renal calculi disease formation has long been recognized. Magnesium ammonium-phosphate (struvite) stones (a conglomeration of bacteria, crystals and protein matrix) form due to urinary tract infection (UTI) with urease-producing bacteria. Stag horn calculi are known to have bacterial growth within.

Calculus renal disease is one of the commonest problems encountered in general urology practice and PCNL is the main stay of treatment for these patients with sizable renal calculi. Postoperative urinary tract infections (UTIs), Secondary haemorrhage of infective origin, and, surgical site infections (SSIs), are known infection related complications of Percutaneous Nephrolithotomy (PCNL), leading to significant morbidity. Sepsis, bacteruria, septicemic shock are also known and reported in many studies.

The effectiveness of perisurgical antimicrobial prophylaxis in reducing postoperative infective complications are well known. But Studies have demonstrated wide variation in utilization of periprocedural antimicrobial prophylaxis, including inappropriate selection of agents, improper timing of administration, and excessive duration of prophylaxis. Also, the emergence of extended spectrum beta lactamase (ESBL) resistant strains are on a rise due to injudicious use of antibiotics

Conclusion

This study is intended to be useful to the practising Urologists and physicians when taking the necessary action to treat the patient.

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