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Effectiveness of EUA Colour Coding System in Urological Procedures During COVID-19

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ABSTRACT

Objectives: To effectiveness of EUA colour coding system in performing urological procedures during COVID-19

Methodology: It is a descriptive Study during three waves of COVID 19, conducted in the Department of Urology at the Institute of Kidney Diseases Hayatabad Peshawar, Pakistan from March 2020 till March 2021. Total numbers of 3066 operated patients were included in the study. We followed the EUA guidelines of color coding for the prioritization of surgical procedures. All the data of the patients and doctors were recorded on structured proforma and was analyzed on SPSS version 20.

Results: Total numbers of 3066 surgeries were performed during three waves of COVID 19, which included 937 (30.5%) emergency Procedures with code black , 1272 (59.74%) high Priority labeled as code red, 636 (29.8%) as code yellow in intermediate priority and 221 (10.3%) as code green in. Regarding emergency surgeries code black, Obstructive uropathy remained high with 566 patients (60.4 %) patients, Pyonephrosis in 187(19.9%), Genito-urinary trauma in 93 (9.9%), miscellaneous in 91 (9.7%). The 1272 patients with high priority were dominated by Complicated Urolithiasis and High-grade Urooncology. The preoperative nasopharyngeal PCR of 206 patients (22 %) in emergency procedures came positive for COVID-19. The rate of positive seroconversion was recorded in 82(6%) in high and 9 (1.5%) in intermediate priority and no seroconversion was recorded in code green.

Conclusion: The EUA guidelines is a useful tool in prioritization of urological procedure.

Keywords: COVID-19, Anuria, Urolithiasis, Urooncology Endourology,

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Introduction

The Pandemic of COVID-19 due to a novel coronavirus has shattered the health system of the developed world.[1] Due to lack of evidence and unpredictability of the nature of diseases, the scientific data is continuously evolving.

The already fragile health system of Pakistan has been further fragmented by the outbreak of COVID-19. According to the epidemiological statistics, the total number of cases in Pakistan is 870K with more than 15000 deaths.[2] The main concern with COVID-19 is a high rate of infectivity rather than fatality. The first case of COVID 19 in Pakistan was reported in February 2020. Since then the Health care facilities have restricted their routine outpatients and surgeries owing to the instructions of the Government of Pakistan. So this pandemic has affected the treatment schedules of all the patients presenting to Urological Hospitals. [3]

American Urological Association and European Urological Associations (EUA) have taken the lead in devising some guidelines for the management of Urological Patients during COVID-19. The EUA has categorized the urological procedures with color coding. The emergency procedures have been coded black that includes life threatening situation that cannot be postponed for more 24 hours. The High priority procedures are coded as red where it is advised to prevent delay of > 6 weeks because death will likely to happen if

these cases are postponed > 6 weeks. The intermediate priority is coded as yellow, and it is recommended that these procedures should not be postponed for more than 3 months, as the complications of not doing the surgery might overcome the benefits of timely surgeries. The low priority coded as green means that the Clinical harm in terms of progression, metastasis, loss of function) is very unlikely if these procedures are postponed 6 months[4]. Despite the introduction of coding systems for the identification of diseases, there is paucity in existing literature regarding the fate of procedures both on patients and health care providers. The rationale of this paper is to effectiveness of urological procedures according to EUA guidelines during COVID-19 and its impact on the overall health of patients and health care providers.

Methodology

It is a descriptive study during three waves of COVID 19, conducted in the Department of Urology at the Institute of Kidney Diseases Hayatabad Peshawar, Pakistan from March 2020 till March 2021. Total numbers of 3066 operated patients were included in the study. We followed the EUA guidelines of color coding for the prioritization of surgical procedures. We included all the patients who were operated on during the study duration irrespective of age, gender, and etiology. We followed the EUA coding system of prioritizing the procedures. The emergency procedures were taken directly to the operating rooms after preliminary work up not waiting for the result of Nasopharyngeal PCR as it usually takes 48 hours in Pakistan. The high, intermediate and low priority cases were first tested for COVID-19 before shifting to the operation theatre. The COVID statuses of all the doctors were initially checked before the initiation of the study. All of the procedures were performed under strict aseptic techniques and with full personal protective equipment (PPEs). All the data of the patients and doctors were recorded on structured proforma and was analyzed on SPSS version 20.

Results

During three waves of COVID 19, we performed 3066 surgeries according to the EUA colour coding system. Total numbers of surgeries in first wave (March- July 2020) were 1243 (40%), 1357 (44.2%) surgeries during (August-December 2020) second wave, and 466 (15%) during the ongoing third wave (Jan-March 2021)

A total number of 937 emergency surgeries with code black were performed during COVID 19. The presentation of patients labeled as Emergency in code black is shown in Table I.

The mean age of the patients in code black was 39.4±19.2 patients with predominantly male patients 524 (56%) patients.

We performed 1272 (59.74%) high priority surgeries labeled as Code red on patients who were first labeled as COVID Negative on PCR that included mostly Urolithiasis 783 patients, Urooncology 319 patients, and Urosepsis 170 patients respectively. The mean age of the patients in code red was 35.6±24.2 patients with predominantly male patients 477 (61.4%) patients. The details are shown in Table II.

A total of 636 cases were performed in intermediate priority during COVID-19. When the national data of NCOC reported the COVID rate of less than 5 percent, the details are shown in Table III.

The 221 (10%) patients labeled as code green patients were microscopic varicocelectomy in 66 patients,

Table I: Detail of Code Black (Emergency) during COVID-19 (n=937)

Diagnosis	Type of Procedure	No of Patients	Percentage
Anuria due to Urolithiasis	Cystoscopy and DJ stenting	566	60.4%
Pyonephrosis	Percutaneous Nephrostomy	187	19.9 %
Genitourinary trauma	Penetrating Injury	21	9.9 %
	Blunt Bladder Injury	32	
	Urethral Injury	40	
Emphysematous Pyelonephritis	Emergency Nephrectomy	11	1.1 %
Penile Fracture	Repair	18	1.9 %
Torsion Testis	Exploration & Orchiopexy	09	0.9 %
Priapism	El Ghorab Shunt	23	2.4%
Miscellaneous	Clot retention	30	3.2%
Total		937	100 %

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Table II: Details of Code Red High Priority during COVID-19 (n=1272)

Etiology	Procedure	Number of Patient	Percentage
High grade bladder tumor	Trans urethral resection of Bladder Tumor (TURBT)	132	25.5%
	Radical Cystectomy	02	
Renal Tumor	Radical Nehrectomy	108	
Upper tract Urothelial Carcinoma	Nephroureterectomy	21	
Metastatic Adenocarcinoma Prostate	Bilateral sub capsular Orchidectomy	56	
Urolithiasis	Ureteroscopy & ICL	487	61.5%
	Percutaneous Nephrolithotomty	169	
	Open stone surgery	69	
	Nehrectomy	58	
Urosepsis	Percutaneous Nephrostomy	121	13.%
	Perinephric Abscess drainage	33	
	Psoas Abscess drainage	16	
Total		1271	100

Table III: Details of Code Yellow Procedures (Intermediate Priority) during COVID-19 (n=636)

Etiology	Procedure	No of patients	Percentage
Enlarge Prostate	Trans urethral resection of Prostate TURP	178	27.9%
Staghorn Stones	Percutaneous Nephrolithotomty PCNL	121	19%
Pelviureteric Junction Obstruction	Pyeloplasty	118	18.5%
Urethral Stricture	Internal Optical Urethrotomy	132	21%
Neurogenic Bladder	Ureterostomy/Augmentation	32	5%
Posterior Urethral Valves	PUV fulguration	55	8.6%
Total		636	100

Hypospadias repair in 89 patients, Epispadias repair in 10 patients, VVF repair in 33 patients and Ureteric reimplantation in 23 patients.

We encounter 297 patients who were diagnosed as COVID 19. The preoperative nasopharyngeal PCR of 206 patients (22%) in emergency procedures came positive for COVID-19. The rate of positive seroconversion was recorded in 82(6%) patients in high and 9 (1.5%) in intermediate priority and no seroconversion was recorded in code green. We recorded 30-day mortality in 39 patients (13.6%) with COVID 19. A total number of 30 doctors of Urology remained involved in the management of patients. Those include were 5 anesthesiologists, 5 consultant Urologists, and 20 postgraduate residents. Out of 30 doctors, 16 became seropositive for COVID-19 at a rate of 53.3%. We recorded 1 mortality of Consultant anesthesiologist among doctors as health care providers.

Discussion

COVID-19 has now spread to most countries including Pakistan. The World Health Organization WHO has declared COVID-19 as a pandemic on March 11, 2020. This pandemic has put a question mark on the unpreparedness of the Health care system across the globe. The present study has shown the usefulness of EUA coding system in performing the urological procedures. However, it has also highlighted the gravity of a higher rate of infectivity resulting in morbidity as well as mortality.

As a surgical subspecialist, the urologist typically performs a high volume of scheduled surgeries in ambulatory surgery centers and hospital-based operating rooms, in addition to clinic procedures and ambulatory clinic visits. This traditional healthcare delivery pattern has been severely disrupted by COVID-19.[5,6]

Here, we report the first study in the current setup that has addressed urological procedures in tertiary care hospitals meant only for Nephro-urological Diseases during the hard times of COVID-19. Participation provides a means of measuring performance against agreed standards, supports best practice, and demonstrates the profession's commitment to improving patient care. Our study also highlights the impact of the novel coronavirus on our patients and doctors. In the present study, Urolithiasis causing Anuria, trauma, Pyonephrosis were found the most frequent reason for

emergency surgery labeled as code black in EUA color-coding system that needs emergency management not taking into consideration the status of COVID. The same has been reported by *Richard at all and Luigi F. Da Pozzo.*[7] They stated the potential effects of this pandemic on urological service and their findings were consistent to our study. The present audit presented that the code red priority is dominated by complicated Urolithiasis and High stage and Hig grade Urooncology *Silvia et al, Franco et al, Guido et al* stated similar findings.[8, 9]

Post-operative seroconversion was noted among the patients and hence they were managed conservatively in isolation with necessary supportive treatment. There is also a 13.6%, 30 days' mortality noted in our study who were tested COVID Positive.

When treating patients during the COVID- 19 pandemic, a major issue is disease transmission from the patient to the medical staff. Patients with symptomatic COVID-19 should be treated in the field of Urology only when the indication is urgent or an emergency. We found high rates of infectivity up to 66% for health care providers. Additionally, asymptomatic patients and patients undergoing the incubation period can be carriers of COVID-19 virus and can be responsible for infection transmission.[10] It is even debated whether patients in the recovery phase are potential sources of virus transmission.[11] Based on current clinical evidence, it seems that transmission of virus takes place by respiratory droplets. In addition, fecal–oral routes, urinary splashes are discussed as well.[12,13,14] An early report on hospitalized patients revealed that hospital-acquired transmission accounted for 41.3% of these patients.[16,17,18] which is higher than the present study. But the sample size of the present study is very high owing to more chances of infectivity. Strict compliance with COVID Protocols and following EUA guidelines are important in tackling urological surgeries in this pandemic. [19,20,21]

A reduction of elective surgery labeled as code green [19, 22] is chosen to free manpower to allow room for specialties that treat COVID-19 itself and to maximize the number of available hospital beds to meet the prospective number of patients, including those who will become critically ill. The same has been adopted in the present study. The future implication of this study can be proved helpful to urologists, general practitioners, surgical oncologists, and general surgeons. Statistical data and various references added also strengthen our study in term of the effective and timely administration of health care facilities during COVID-19 Pandemic. The same has been the emphasis of current literature in accordance with the present study.[23,24]

Conclusion

In conclusion, inspired by the Roman Aphorism*Si vis pacem, para bellu*m (if you want peace, prepare for war), urologists have to be prepared to fight the COVID-19 pandemic to return to long-lasting normality as soon as possible. EUA colour coding system is an effective tool in prioritizing the urological patients for surgical management.

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