NU Rounds

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Dear Doctor,

Greetings from Micro Labs limited. We are happy to bring you "NU Rounds" which contains latest and interesting news in the field of Nephrology and Urology.

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Best Regards,

Medical Team, Micro Labs Ltd

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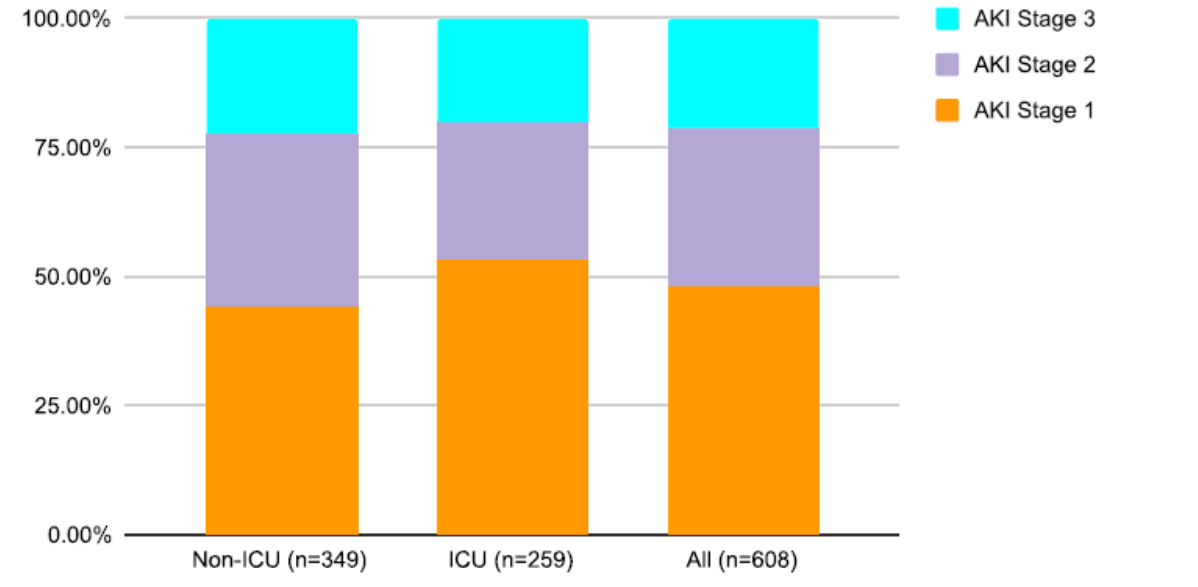
Nephrology and Urology

1. Incidence, Mortality, Stage, and Recovery of Acute kidney injury (AKI) in COVID-19 patients.

Introduction:

Patients with severe coronavirus disease 2019 (COVID-19) are most commonly admitted to the critical care unit for hypoxemic respiratory failure requiring mechanical ventilation or hypotension requiring vasopressor therapy.[1] AKI data is either lacking or only reported on the basis of case studies and retrospective research. AKI is defined as a change in serum creatinine of 0.3 mg/dL or greater within 48 hours, or a 1.5-fold increase in serum creatinine over the baseline within the last 7 days, or urine output of less than 0.5 mL/kg/hr for 6 hours. Age above 65, as well as the presence of certain comorbidities such as hypertension, heart disease, liver disease, chronic kidney disease (CKD), peripheral artery disease, and diabetes, are all risk factors for AKI.[2] The ratio of creatinine to baseline creatinine, or the stage of AKI, must be determined to identify the severity of AKI. AKI Stage 1 occurs when the creatinine level is 1.5 to 1.9 times the baseline level at the time of AKI. AKI stage 2 occurs when the creatinine level is 2–2.9 times the baseline, while AKI stage 3 occurs when the creatinine level is greater than 2.9 times the baseline.[2] The goal of this study is to assess the incidence, mortality, stage, and recovery of acute kidney injury (AKI) in COVID-19 patients, as well as to investigate the impact of patient demographics and comorbidities on AKI incidence.

When admitting COVID-19 patients, careful resource planning is required. Early consultation with a nephrologist is recommended, and efforts to improve outpatient follow-up in the nephrology clinic should be established.



Acute kidney injury (AKI) stages and intensive care unit (ICU) admission.(n= no of Patients)

Methods:

Researchers evaluated 1546 patient records over the age of 18 who were admitted to the hospital and tested positive for COVID-19 using a SARS-CoV-2 PCR test from. Patients who were pregnant, on dialysis for end-stage renal illness, or who had previously received a kidney transplant were excluded from the study. The researchers next used the KDIGO AKI criteria given in the introduction to assess which patients had AKI and at what stage of the disease they were in. The most recent creatinine level collected between 7 and 365 days prior to admission was taken as the baseline creatinine. If no such number was found in the patient's medical records, a standardised baseline was calculated using a GFR of 75 mL/min/1.37m^2 through the MDRD equation. The data was further stratified to evaluate at the incidence, stage, and outcome of these AKI patients based on demographics, comorbidities, and whether or not they were admitted to the ICU.

Results:

The study looked at 1545 patient records from people who had a positive SARS-CoV-2 PCR test and were admitted to the hospital. COVID-19 patients had a 39 % AKI rate, with a 58.2 % death rate. 74.8 % of the 254 survivors survived. Furthermore, AKI patients were admitted to the ICU were 42.6 %. During their stay in the hospital, twenty-six of our patients had haemodialysis. A statistically significant relationship existed between AKI and age, race, hypertension (HTN), diabetes mellitus (DM), hepatitis C (HCV), congestive heart failure (CHF), CKD, patient outcome, and inpatient days. 294 (48.4%), 185 (30.4%), and 129 (21.2%) of the 608 patients with AKI, respectively, had AKI stages 1, 2, and 3.

Discussion:

Approximately 1500 COVID-19 individuals were admitted to the hospital, and % had AKI, with 58.2 % of those patients dying during their stay. The majority of the patients who survived had a full recovery, as measured by their creatinine levels returning to baseline. In addition, 42.6 percent of AKI patients were admitted to the intensive care unit (ICU). Our patient sample had a much greater rate of AKI than that reported in other trials around the world.[3] However, when researchers examine the numbers to those of other studies conducted, they find that they are similar.[4] This could be due to the high prevalence of AKI risk factors in our patient population, such as age, race, hypertension (HTN), diabetesmellitus (DM), coronary artery disease (CAD), congestive heart failure (CHF), and congestive heart failure (CHF), all of which showed a significant association with AKI.

Conclusion:

The findings of this research tells that COVID-19 may play a role in the development of AKI. Patients admitted with COVID-19 may consider taking preventative measures. Because the kidneys' long-term consequences are unpredictable, resource planning and measures to increase long-term understanding and kidney care are required. Early consultation with a nephrologist is recommended, and nephrotoxic drugs should be avoided. Finally, to avoid the

beginning of AKI, discharge planning with a follow-up nephrology consultation should be considered.

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2. Restenosis rates at the cephalic arch after percutaneous angioplasty and stenting procedures in patients with brachiocephalic fistulae

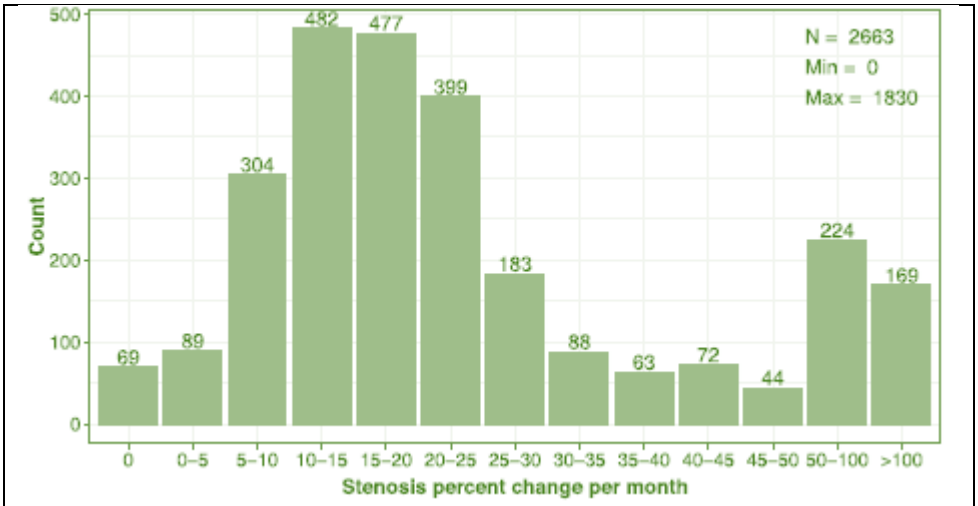
Introduction:

Kidney failure is a condition that necessitates the use of kidney replacement therapy (KRT). The KRT of haemodialysis is used to treat the majority of patients. Using a vascular access, blood is filtered three or more times each week.[1,2] Arteriovenous fistulae (AVFs), arteriovenous grafts (AVGs), and catheters are all examples of dialysis access. When compared to catheters and AVGs, AVFs are the preferable access because they provide greater function and have fewer infection and death rates.[1] For numerous reasons, including as ease of formation, high maturation rates, and high flow rates, the brachiocephalic fistula (BCAVF) is one of the most popular types of AVFs. With the rising popularity of BCAVF comes new complications arise that must be addressed in order to avoid failure. The cephalic arch is the most common site of stenosis in BCAVF.[1] Increased flow in an outflow vein, external compression by fascia and pectoralis major, angulation, numerous valves in the outflow vein, and biochemical changes associated with kidney failure are all potential etiologies for stenosis and subsequent restenosis at the cephalic arch. Multiple Factors are most likely involved in the occurrence and recurrence of stenosis at this site. There have been no large multicenter trials on the management and effectiveness of percutaneous cephalic arch procedures in BCAVFs to far. The purpose of this study was to evaluate the rates at which hemodialysis patients with brachial artery to cephalic vein arteriovenous fistula (BCAVF) had restenosis at the cephalic arch after percutaneous angioplasty and stenting procedures.

Use of stent grafts seemed to lessen recurrent stenosis, especially if used as the first stent

Methods:

Adult hemo-dialysis patients treated at a national network of 44 outpatient inter-ventional facilities were studied. Adult patients with a brachiocephalic AVF (BCAVF) who: 1) were referred for an access malfunction evaluation, 2) got an angioplasty or stent for therapy of stenosis at the cephalic arch, and 3) had one subsequent evaluation of the cephalic arch. Following the initial referral, the interventionalist either planned a clinically timed evaluation or made another referral. From the first index through the second procedure, and for up to four additional encounters, the median % restenosis per month at the cephalic arch and days between encounters were calculated. The analyses were divided into groups based on the intervention and device kinds.



Distribution of restenosis rates at the cephalic arch after the 1st index to 2nd visits among patients treated with angioplasty

Results:

Researchers identified 3301 individuals with a BCAVF who had an angioplasty, or stent, at the cephalic arch for an index and one follow-up surgery (mean age 62.2 13.9 years, 58.5 % male, 33.2 % white race). Patients who had an angioplasty (n = 2663) or a stent (n = 933) between the first and second index procedures had a median decrease in luminal diameter of 18.9% and 16.5 % per month, respectively, and a median time between encounters of 93 and 91 days. Standard and high-pressure angioplasties had similar restenosis and day rates. When compared to stent grafts, bare metal stents had a 10.1 % greater restenosis rate. The frequencies of restenosis and the time it took to get restenosis were relatively consistent in future encounters.

Discussion:

The development of primary and recurring stenosis in various places of the vascular access is one of the most prevalent, and readily managed, problems with AVFs.[1] Although literature has supported the use of stent graft insertion over angioplasty alone for dialysis access stenosis, angioplasty has been a staple of treatment for dialysis access stenosis. In BCAVFs, recurrent stenosis and several interventions are typical in the cephalic arch, hence alternate treatments should be considered in appropriate cases when angioplasty has failed. Stents are one of them, with stent grafts appearing to have the best results in our research. Stent grafts have also been

proven to be more effective than bare metal stents and angioplasty alone in the treatment of lesions in AVFs and AVGs.[3]

Conclusion:

According to the findings, haemodialysis patients with a BCAVF who need an angioplasty or a stent to cure a stenosis in the cephalic arch will have the stenosis reformed at a rate of 18.9 and 16.5 % per month after the initial intervention, respectively. The findings imply that within three months of the previous intervention, patients are at risk of developing significant lesions at the cephalic arch.

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3. Comparison of Thulium Fibre Laser versus Holmium:YAG for Ureteroscopic Lithotripsy

Introduction:

In recent decades, the holmium:yttrium-aluminum-garnet (Ho:YAG) laser has been the gold standard for ureterorenoscopic (URS) lithotripsy. Thulium fibre laser (TFL) is a new technology that has the potential to challenge Ho:YAG as the laser of choice due to a variety of advantages TFL achieves a fourfold better absorption coefficient than Ho:YAG by emitting pulsed infrared light at a wavelength of 1940 nm, which is near to the water absorption peak. This equates to a low tissue ablation and stone lithotripsy threshold. [1] In clinical practise, TFL is believed to be particularly effective at disintegrating stones. TFL lithotripsy may be up to four times faster than Ho:YAG lithotripsy when the same energy settings are used, according to previous laboratory studies.[2] TFL treatment for urolithiasis, on the other hand, may be more effective when moderately lower energy settings are used, similar to those used with Ho:YAG.[2] The primary purpose of the study was to compare stone-free rates (SFRs) after URS lithotripsy with Ho:YAG and TFL for both ureteral and renal stones. Objectives included comparing the two

When compared to Ho:YAG, TFL benefited more patients with kidney stones become stone-free and had fewer intraoperative complications.
The TFL laser is quickly becoming the laser of choice for stone lithotripsy.

lasers' results in terms of operational time, complications, and the rate of postendoscopic ureteral stenting.

Methods:

Patients aged ≥18 years and older with ureteral and/or renal stones (≥5 mm) scheduled for day-case URS lithotripsy were invited to participate in this prospective randomised study. A total of 120 consecutively hospitalised patients with signed consent were randomly assigned to the trial. URS lithotripsy with Ho:YAG or TFL was used as the treatment. At 3-month follow-up, the primary outcome was the stone-free rate (SFR) as determined by noncontrast computed tomography. The operation time and complications were secondary outcomes. The t test and the Chi-square test were used to compare the outcomes of the two groups.

Results:

The SFR was 67 % in the Ho:YAG group and 92 % in the TFL group after a single session, p = 0.001. The SFR was 100 % in both groups for ureteral stones, and 49 % (Ho:YAG) and 86 % (TFL) for renal stones, p = 0.001. TFL took 49 minutes to perform compared to 57 minutes for Ho:YAG, p = 0.008. The most common intraoperative adverse event was bleeding that obstructed the endoscopic view, which occurred in 13 patients (22 %) in the Ho:YAG group and three (5 %) in the TFL group, p = 0.014.

Complication	Holmium group	Thulium group	*p* value
Total adverse events, *n* (%)[a]	16 (27)	5 (8)	0.011[b]
Bleeding impairing vision, *n* (%)	13 (22)	3 (5)	0.014
Perforation, *n* (%)[c]	1 (2)	0 (0)	1
Mucosal abrasion, *n* (%)[d]	6 (10)	2 (3)	0.3

Intraoperative complications

Discussion:

The results of URS lithotripsy with Ho:YAG or TFL were compared in this study. When TFL was used instead of Ho:YAG, significantly more patients were stone-free after a single session (92 % vs 67 %; p = 0.001). The SFR for ureteral stones in both groups was % when examined further according to stone location. The SFR for renal stones was 86 % for TFL and 49 % for Ho:YAG, with a p value of 0.001. The 49 percent SFR for Ho:YAG may appear low in contrast, but it nevertheless shows an improvement over HUH's previous report. [3] While no procedures were cancelled due to intraoperative complications, bleeding that impeded endoscopic vision happened substantially more frequently with Ho:YAG (22% vs. 5% for TFL), p = 0.014. Martov et al. obtained a similar finding.[4]

Conclusion:

TFL obtained significantly greater SFRs than Ho: YAG after single-session URS lithotripsy for renal stones. Furthermore, TFL use resulted in significantly shorter operational times and significantly fewer intraoperative complications. The findings of this randomised experiment back up the use of TFL as the preferred laser for endoscopic renal stone lithotripsy.

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4. Inappropriate antidiuretic hormone secretion after high dose rate brachytherapy for prostate cancer

Introduction:

The syndrome of inappropriate antidiuretic hormone secretion (SIADH) is a condition characterised by excessive antidiuretic hormone (ADH) release, resulting in increased water retention.[1]Reduced serum osmolality less than 275 milliosmole (mOsm), increased urine osmolality greater than 100 mOsm, euvolemia, increased urine sodium greater than 20 milliequivalent/L (mEq/L), and no other cause for hyponatremia such as diuretics, hypercortisolemia, or thyroid dysfunction are the Bartter and Schwartz criteria for diagnosing SIADH. Malignancy, CNS ailments, including changes in the hypothalamic-pituitary-renal axis, pulmonary diseases, medications, acute physiologic stresses such as pain and infection, and surgical operations are among the causes of SIADH.[2] When hypotonic hyponatremia occurs, intracellular water shift occurs, resulting in symptoms like headaches, nausea, vomiting, disorientation, and seizures. In the literature, there are just a few occurrences of symptomatic hyponatremia due to SIADH after radiation therapy (RT). here is a case of a patient who developed symptomatic hyponatremia due to SIADH, following prostate HDR brachytherapy.

Inappropriate antidiuretic hormone secretion might occur after high-dose rate brachytherapy for prostate cancer. early diagnosis is important to ensure prompt and efficient management.

Case Presentation:

A 74-year-old patient with a cT1cN0M0, Gleason 4 + 3, and a pre-treatment PSA of 3.9 ng/mL, NCCN unfavourable intermediate-risk adenocarcinoma of the prostate was treated with a combination of prostate HDR brachytherapy to 15 Gy in 1 fraction followed by pelvic nodes external beam RT to 46 Gy in 23 fractions with neo-adjuvant, concurrent and adjuvant ADT for 4 months. Asthma, palpitations, hypercholesterolemia, and hypertension were among the patient's past medical history. Patient was on Atenolol, atorvastatin, and leuprolide. The HDR brachytherapy procedure for the patient was uncomplicated and performed under general anaesthesia, under the institutional standards . For the delivery of the radiation dose, fifteen needles were inserted transperineally. During the surgery, there were no signs of pain or discomfort.

Patient was administered 1.5 litres of normal saline and had 0.45 litres of urine output during the treatment. Patient was taken to the PACU after the procedure and stayed for 10 hours before being discharged. Although there was no nausea, vomiting, or confusion while in the PACU, the patient did develop polydipsia. Patient consumed a total of 8.250 L of water, eating approximately 0.5–1.5 L per hour, but only 0.425 L of urine output, resulting in a net positive fluid balance of 8.875 L, according to a retrospective chart review. Patient had moderate nausea prior to discharge but seemed to be fine, and met the PACU's standard discharge criteria, hence sent home. Patient developed intractable nausea, projectile vomiting, and abdominal discomfort the night after discharge. Patient presented to the emergency department the next day with generalised weakness, dizziness, and light-headedness. Patient had dry mucous membranes on physical examination, and additional testing confirmed hyponatremia, with a serum sodium level of 120 mEq/L. The results of preoperative lab tests, including serum sodium conducted a week prior to the procedure, were normal. Serum osmolality, urine osmolality, and urine sodium were 250 mEq/L, 712 mEq/L, and 137 mEq/L and 137 mEq/L, respectively. Patient was then hospitalised for SIADH-related acute severe hyponatremia. sodium was gradually adjusted with hypertonic saline, with a daily aim of 6–8 mEq/L, and was put on a fluid restriction of less than 2 L of free water. Patient's symptoms, which included nausea, vomiting, lightheadedness, and dizziness, began to improve the next day as his serum sodium began to improve, and by the second hospitalisation day, all of his symptoms had resolved. The patient was admitted to the hospital for 2 days and discharged with a serum sodium level of 130 mEq/L. Patient was advised to keep a 2 L per day hydration limit and to see primary care physician for repeat lab test on a regular basis. Patient's sodium levels stayed within normal ranges on follow-up tests two days after hospital discharge, and fluid restriction was withdrawn.

Discussion:

The chance of developing SIADH and, as a result, hyponatremia in the post-operative period is high, which can lead to serious and sometimes fatal consequences such as cerebral edoema. Patients with certain malignancies, most commonly small cell carcinoma, may develop SIADH as a paraneoplastic condition. Small cell carcinoma, a type of neuroendocrine tumour, is most usually found in the lungs, although it can also be found in the prostate. There have been some cases of SIADH in patients with small cell prostate cancer and adenocarcinoma with neuroendocrine characteristics who were not treated with brachytherapy.[3] The patient in this case had adenocarcinoma of the prostate with no neuroendocrine differentiation, indicating an aetiology other than his malignancy's histology. Longer hospital admissions and, in some cases, increased morbidity and death can ensue from a delay in diagnosis.[4] Identifying and resolving the underlying aetiology of such SIADH is ultimately the main aspect of patient therapy in these circumstances, in addition to correcting the hyponatremia.

Conclusion:

This study concludes that, in rare cases, after high-dose rate brachytherapy for prostate cancer, abnormal release of antidiuretic hormone can develop. The cause is most likely multifaceted, including pain or discomfort caused by the surgical process, general anaesthesia, or intraoperative medications. However, because of the potential severity of the adverse effects, early diagnosis is essential for rapid and effective treatment.

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