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Nonlinear relationship between blood glucose and 30-day mortality in critical patients with acute kidney injury: A retrospective cohort study

Background: Acute kidney injury (AKI) is a major health problem affecting millions of people worldwide. Effective preventative and therapeutic treatments remain to be produced. We aim to determine the association between blood glucose and mortality in critical patients with AKI.

Method: This cohort study included 18,703 patients with AKI. The exposure of interest was baseline blood glucose. The outcome was 30-day mortality. Multivariable Cox regression analyses and smooth curve fitting were adopted to assess the independent association between blood glucose and 30-day mortality.

Results: We identified 18,703 consecutive individuals with AKI. The average age of the participants was 66.8 ± 16.0 years, and about 42.7% of them were female. The overall 30-day mortality was 16.9%. Through the multivariate COX regression model and smooth curve fitting, we observed that the correlation between blood glucose and 30-day mortality is nonlinear. An inflection point was found at about 5.93 mmol/L. On the left side of inflection point, the effect size was 0.81 (HR: 0.81, 95% CI 0.74-0.89, $p < 0.001$). On the right side of inflection point, the effect size was 1.02 (HR: 1.02,95% CI 1.01-1.03, $p < 0.001$).

Conclusion: Our study suggested that, among patients with AKI, there was a nonlinearity relationship between blood glucose and mortality in patients with AKI. The optimal of blood glucose associated with the lowest risk of 30-day mortality was around 5.93 mmol/L.

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Prognostic factors for chronic kidney disease and end-stage renal disease in patients with lupus nephritis: A retrospective cohort study

Background: Lupus Nephritis (LN) occurs in approximately half of all patients with Systemic Lupus Erythematosus (SLE) and it is the most common cause of morbidity and mortality in patients with SLE. Factors associated with poor renal outcome vary among studies, and researches coming from Brazil are scarce.

Objectives: To identify the prognostic factors associated to the development of Chronic Kidney Disease (CKD) and End Stage Renal Disease (ESRD) in LN patients followed in a tertiary hospital.

Design and Settings: We conducted a retrospective cohort study set in a tertiary hospital in Fortaleza, Ceará, Brazil. Methods: We compiled a total of 214 LN patients diagnosed between 1983 and 2015. Data was collected from medical records and further analyzed using logistic regression.

Results: LN prevalence was 53.9%. The cohort had a mean follow-up of 11.2 years (SD ± 7.2 years). At the end of follow-up, 93 of 197 patients (47.2%) had CKD, and 49 of 191 (25.6%) were on regular dialysis. The main factors associated for developing CKD after logistic regression analysis were the following predictors: hypertension (HR 2.80; 95% CI 1.30-6.01; $p = 0.008$), time between diagnosis of SLE and diagnosis of LN (HR 0.98; 95% CI 0.97-0.99; $p = 0.009$) and discontinuation of medications (HR 2.41; 95% CI 1.08-5.37; $p = 0.03$).

Conclusion: Hypertension, discontinuation of medications, and time between diagnosis of SLE and diagnosis of LN are independent variables associated with the development of CKD and ESDR in our study.

Case Report **Published Date:-2021-04-22 00:00:00**

Diffuse alveolar hemorrhage: Unusual presentation of systemic lupus erythematosus

Diffuse alveolar hemorrhage (DAH) is a rare complication of systemic lupus erythematosus (SLE) and carries a high mortality.

It was first described by Osler in 1904 as the most devastating pulmonary complication of SLE.

We describe a case of a 23-year-old girl recently diagnosed with SLE associated by a class III nephritis treated with oral corticoids and mycophenolate mofetil who developed a Diffuse Alveolar Hemorrhage DAH a few days later. The early diagnosis and the aggressive therapy allowed us to have a favorable outcome.

Research Article **Published Date:-2021-04-08 00:00:00**

Collecting duct PGE2 responses reduce water loss with empagliflozin in mice with type 2 diabetes mellitus

Introduction: Sodium-glucose cotransporter 2 inhibitors such as empagliflozin (EMPA) protect against diabetic kidney disease. Prostaglandin E2 (PGE2) the main renal product of cyclooxygenase-2, inhibits vasopressin (AVP)-water reabsorption in the collecting duct (CD). The novelty of this study is that for the first time, we examined if EMPA affects the renal PGE2/EP receptor system and determined if CD responses to EMPA prevent water loss.

Methods: Four groups of adult male mice were studied after 6 weeks of treatment: control (db/m), db/m+EMPA (10 mg/kg/day in chow), type 2 diabetic diabetic/dyslipidemia (db/db), and db/db+EMPA. Tubules were microdissected for quantitative polymerase chain reaction (qPCR) and CD water transport was measured in response to AVP, with or without PGE2.

Results: Hyperglycemia and albuminuria were attenuated by EMPA. Renal mRNA expression for COX, PGE synthase, PGE2 (EP) receptor subtypes, CD AVP V2 receptors and aquaporin-2 was elevated in db/db mice, but unchanged by EMPA. Urine PGE2 levels increased in db/db but were unchanged by EMPA. AVP-water reabsorption was comparable in db/m and db/m+EMPA, and equally attenuated to 50% by PGE2. In db/db mice, AVP-water reabsorption was reduced by 50% compared to non-diabetic mice, and this reduction was unaffected by EMPA. In db/db mice, AVP-stimulated water transport was more significantly attenuated with PGE2 (62%), compared to non-diabetic mice, but this attenuation was reduced in response to EMPA, to 28%.

Conclusion: In summary, expression of renal PGE2/EP receptors is increased in db/db mice, and this expression is unaffected by EMPA. However, in diabetic CD, PGE2 caused a greater attenuation in AVP-stimulated water reabsorption, and this attenuation is reduced by EMPA. This suggests that EMPA attenuates diabetes-induced excess CD water loss.

Research Article **Published Date:-2021-03-08 00:00:00**

Incidence and risk factors of vancomycin-associated acute kidney injury in a single center: Retrospective study

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Background: There is enough evidence to suggest that vancomycin increases the risk of acute kidney injury (AKI) but the exact mechanism is not well understood. This study aims to understand the incidence of vancomycin-associated acute kidney injury (VA-AKI) among hospitalized patients and to identify the risk factors for VA-AKI.

Methods: Patients aged 18 and above who received a minimum of 24 hours of intravenous vancomycin and who had serial creatinine measurements over a 13-month period were identified through electronic records. Patients with pre-existing AKI, or eGFR of less than 30ml/min, and patients with end stage kidney disease were excluded. Results were analyzed using t-test and Fisher's test. A logistic regression model was used to identify the predictors for VA-AKI.

Results: From the 598 patients who met the inclusion criteria, 70 developed AKI. Compared to those without AKI, patients with VA-AKI had higher mean serum vancomycin trough levels (22.6 mg/L vs. 14.6 mg/L), and a statistically significant longer duration of vancomycin use (6.7 vs. 5.2 days). Multivariate analysis revealed that serum vancomycin level of > 20 mg/L was associated with a six-fold increase in odds of VA-AKI when compared to those with vancomycin levels < 15 mg/L. The presence of hypotension, iodinated contrast use, and concomitant use of piperacillin-tazobactam were all associated with increased odds of VA-AKI.

Conclusion: The incidence of VA-AKI in hospitalized patients with eGFR > 30 ml/min was 11.7%. Serum vancomycin levels of > 20 mg/L, hypotension and administration of iodinated contrast significantly increased the risk of VA-AKI. Piperacillin-tazobactam, when used with vancomycin, was noted to be an independent predictor of AKI, regardless of serum vancomycin trough levels, prompting a reevaluation of the safety of this widespread practice as empiric therapy. Close monitoring of kidney function, avoiding high serum vancomycin levels, maintaining hemodynamic stability, and avoiding unnecessary use of iodinated contrast seem to be essential for the prevention of VA-AKI.

Case Report **Published Date:-2021-03-08 00:00:00**

Prostate cancer-associated thrombotic microangiopathy: A case report and review of the literature

Background: Thrombotic microangiopathy (TMA) is a rare and life-threatening complication of prostate carcinoma. Whether plasma exchange has a role in treatment remains a subject of debate. Here we present a case followed by a systematic review of the literature on this subject.

Case report: We describe a 69-year old patient presenting with TMA, which was associated with an underlying metastatic prostate carcinoma. We conducted a search of similar cases in literature.

Results: Our patient was treated and responded well on plasma exchange. Systematic review of the literature showed 17 additional cases of TMA associated with prostate carcinoma of which eleven were treated with plasma exchange with mostly good response.

Conclusion: Based on current data we cannot exclude a potential role for plasma exchange in prostate cancer associated TMA.

Clinical Image **Published Date:-2021-01-20 00:00:00**

Hyperacute fatal course in a hypercalcemic crisis

A 39-year-old woman, with a not significant past medical history, entered the Emergency Department complaining about nausea, vomiting, constipation, anorexia, deep asthenia, and diffuse muscle aches with cramps. She referred sporadic diarrhea (one episode) the day before and a worsening headache in the past three days; she also complained about polyuria and polydipsia not investigated for one year. The clinical examination was not significant, apart from the evidence of skin and mucosal dryness, tachycardia, and diffuse abdominal pain. The laboratory tests revealed hypokalemia and elevated beta-human chorionic gonadotropin (?-hCG) plasma levels. An ultrasound abdominal imaging was consistent with kidney lithiasis. Suspecting a hyperemesis gravidarum in a patient with kidney lithiasis, a rehydrating therapy was administered as long as potassium reintegration. During the hospital stay, the patient became drowsy. A haemogasanalysis revealed very high calcium values: 3,379 mmol/L (n.v. 1,120-1,320 mmol/L). Lab tests confirmed very high levels of calcium 21,1 mg/dL (n.v. 9-10,5 mg/dL), as long as increased parathormone (PTH) > 3000 pg/mL (normal values 14-65 pg/mL), and hypokalemia (3,2 mEq/L n.v. 3,50 – 4,50). Ultrasound exam of the neck revealed the presence of a left parathyroid nodule measuring 2,5 x 1,6 cm. Before having time to start an appropriate therapy, the patient died.

Research Article **Published Date:-2021-01-12 00:00:00**

Glomerular hyperfiltration in Yemeni children with sickle cell disease

Background: Glomerular hyperfiltration (GH) is a common feature of sickle cell nephropathy (SCN) starting at infancy and represents an early marker of incipient glomerular injury and renal dysfunction.

Methods: This study aimed to determine the prevalence and correlates of GH among children (? 16 years) with sickle cell disease (SCD) at their steady state, recruited over 6 months at the Pediatric Outpatient Clinic in Al-Sadaqa General Teaching Hospital, Aden, Yemen. Glomerular filtration rate (eGFR) was estimated using the Schwartz formula. Data on clinical history, anthropometry, blood pressure (BP) and laboratory investigations were collected.

Results: Of 101 children (mean age 7.2 ± 3.9 years), 65 (64.4%) were males. The prevalence of GH was observed in 36 (35.6%) children, who were significantly older (10.7 ± 3.2 vs. 5.2 ± 2.7 years, $p < 0.001$) and had a lower fetal Hb level (5 ± 3.3 vs. 9 ± 7.1, $p = 0.02$). All children were normotensive, but hyperfiltrating children showed significantly higher systolic (97.2 ± 7.3 vs. 89.7 ± 5.2 mmHg) and diastolic pressure (55.1 ± 5.0 vs. 49 ± 4.3 mmHg) (all $p < 0.001$). Among evaluated children, 25.7% had hyperfiltration alone, whereas 9.9% had an associated microalbuminuria (MA), and no significant difference in eGFR between those with and without MA (158.4 ± 33.7 vs. 160.7 ± 29.8 ml/min/173m2, $p = 0.84$).

Conclusion: This study demonstrated a relatively high prevalence of GH in Yemeni children with SCD that increased with age. Recognition of hyperfiltration and other early markers of nephropathy in this population could help to develop renal protective strategies to prevent progressive loss of kidney function.
