Poster Presentation：Electrolyte, Acid-Base, and Hypertension
Poster No.：C0407
Abstract Submission No.：APCN20250224

Family history of hypertension is associated with decreased renal function in non-hypertensive individuals

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Abstract

Background: Hypertension (HTN) development, a well-recognized risk factor for chronic kidney disease (CKD), is known to be related with various factors including genetic predisposition, dietary habits, physical activity, and obesity. Most of these HTN related traits are inherited or shared within the family. Therefore, speculating that HTN associated factors may sufficiently impact renal function regardless of actual HTN development, the relationship between family history of HTN and renal function was evaluated.

Methods: A total of 171,964 subjects in in the Korean Genome and Epidemiology Study were include in the analysis. Subjects were classified into groups with or without HTN. HTN was considered present when the participants had a medical history of HTN or were currently being treated for HTN. The association between family history of hypertension and kidney function, defined as estimated glomerular filtration rate (eGFR), was examined in the cross-sectional analysis. In addition, rapid decline of eGFR, define as annual loss of more than 3 mL/min/1.73m2, was analyzed in a longitudinal cohort of 65,177 participants.

Results: The mean age was 53 ± 8 years and 65 % were females. The median follow-up duration was 4 years. The with-HTN group consisted of 33,387 (19 %) subjects. HTN family history was present in 44 and 25 % of the participants in the with- and without- HTN group, respectively. Mean eGFR in subjects with and with HTN family history was 88 ± 15 and 86 ± 15 mL/min/1.73 m2 in the with-HTN group; 94 ± 13 and 92 ± 13 mL/min/1.73 m2 in the without-HTN group. Multivariate regression models showed that a positive family history of HTN was independently associated with decreased eGFR in the without-HTN group (ß, -0.21, 95% confidence interval [CI], -0.37 to -0.05, P=0.008). However, a significant association between HTN family history and eGFR was not found in the with-HTN group.

Conclusion: Family history of HTN may be associated with renal function even in non-hypertensive individuals. Further studies evaluating the effect of managing lifestyle risk factors in those with HTN family history would be needed.

Keywords：HTN, Family history, decreased renal function

Poster Presentation：Electrolyte, Acid-Base, and Hypertension
Poster No.：C0408
Abstract Submission No.：APCN20250279

Cytotoxic Lesions Of The Corpus Callosum Preceding Osmotic Demyelination Syndrome In Hypernatremia And Hyperosmolar Hyperglycemic State: A Case Report

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Abstract

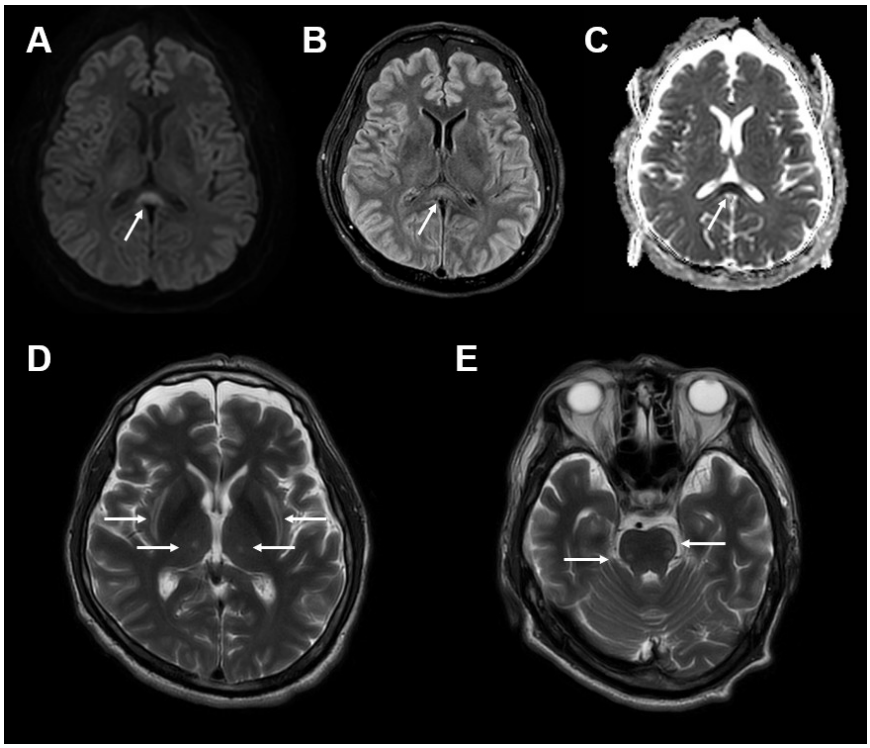
Osmotic demyelination syndrome (ODS) is a neurological disorder associated with osmotic imbalances. Traditionally, ODS has been known to occur following the rapid correction of hyponatremia; however, ODS has also been reported concerning hypernatremia and hyperglycemia. Cytotoxic lesions of the corpus callosum (CLOCC), can arise from various causes, including drugs, vascular diseases, infections, and metabolic disorders. CLOCC caused by electrolyte imbalance is commonly observed in hyponatremia, whereas it is relatively rare in hypernatremia. The simultaneous occurrence of ODS and CLOCC is extremely rare.

A 57-year-old man with no known medical history presented with confusion, irritability, anorexia and vomiting. He had experienced a 10 kg weight loss over six months and reported excessive dietary sugar intake. On admission, vital signs were stable, but physical examination revealed signs of dehydration. Laboratory tests showed severe hypernatremia (corrected sodium 186 mEq/L), marked hyperglycemia (glucose 525 mg/dL, HbA1c 15.1%), and hyperosmolality (401 mOsm/kg). Initial brain MRI showed a diffusion-restricted lesion in the splenium of the corpus callosum (SCC), consistent with CLOCC. The patient received hypotonic fluids and continuous insulin infusion, with gradual correction of hypernatremia and hyperglycemia. Despite normalization of serum sodium and osmolality, his mental status did not recover. On hospital day 14, follow-up brain MRI demonstrated resolution of the SCC lesion but new symmetrical T2 hyperintensities in the external capsules, thalami, hippocampi, and pons—findings suggestive of ODS. The patient regained full consciousness after one month.

This case highlights a sequential occurrence of CLOCC followed by ODS, as a result of hypernatremia and hyperosmolar hyperglycemic state (HHS). To our knowledge, the simultaneous occurrence of CLOCC and ODS is extremely rare, with only a single case previously reported by Y-X Zhang et al. in 2024, in which CLOCC and ODS were induced by hypernatremia only. In conclusion, CLOCC lesions are important radiologic findings and may be observed early in ODS caused by severe hypernatremia and HHS. Therefore, physicians should consider performing proactive brain imaging, and further research is needed to explain the pathological mechanisms associated with CLOCC and ODS.

Figure 1
Initial and follow-up brain MRI scans. Initial MRI revealed a diffusion-restricted lesion in the SCC with high signal on DWI and FLAIR, and corresponding hypointensity on the ADC map (A–C, arrows), consistent with CLOCC. On hospital day 14, follow-up MRI showed new symmetrical T2 hyperintensities in the external capsules, thalami, hippocampi, and pons, suggestive of ODS (D–E, arrows).

Keywords：corpus callosum; magnetic resonance imaging; hypernatremia; hyperglycemia; consciousness



Poster Presentation：Electrolyte, Acid-Base, and Hypertension
Poster No.：C0409
Abstract Submission No.：APCN20250284

Economic Burden of Chronic Hyperkalaemia in China: Results from the NORMALIZE Study

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Abstract

Introduction: Hyperkalaemia (HK, serum potassium level >5.0 mmol/L) has a high recurrence rate, and chronic hyperkalaemia (CHK) requires long-term management, which may be associated with an increased economic burden. This study compared all-cause medical costs and healthcare resource utilization (HRU) in Chinese patients with CHK versus matched cohorts with normokalaemia (NK) and single-HK, respectively.

Methods: This retrospective study used data between January 1, 2017 and December 31, 2023 from the Tianjin Inspur Database. Adult patients with CHK (≥2 HK episodes per year) were matched 1:1 separately to patients with NK or single-HK (only 1 HK episode) using propensity score matching. All-cause medical costs and HRU during the 12-month follow-up were compared between cohorts via generalized estimating equations.

Results: A total of 6,971 and 11,085 matched patient pairs were identified for the CHK vs. NK and CHK vs. single-HK comparisons, respectively, with balanced baseline characteristics. All-cause medical costs and HRU are summarized in Table 1. The mean total medical costs, hospitalization costs and emergency department (ED) visit costs in the CHK cohort were approximately three times as high as those in the NK cohort (Total: ¥63,132 vs. ¥22,231, hospitalization: ¥50,331 vs. ¥14,742, ED: ¥1,445 vs. ¥508, all $p<0.0001$). The mean outpatient (OP) visit costs in the CHK cohort were nearly double those in the NK cohort (¥11,356 vs. ¥6,980, $p<0.0001$). For CHK versus single-HK, the mean all-cause medical costs were also significantly higher in the CHK cohort (Total: ¥67,720 vs. ¥43,629, hospitalization: ¥49,217 vs. ¥29,241, ED: ¥1,597 vs. ¥1,276, OP: ¥16,906 vs. ¥13,112; all $p<0.0001$). For HRU, patients with CHK had significantly higher mean total HRU than those with NK or single-HK (24.0 vs. 16.5, 31.0 vs. 24.6, respectively; both $p<0.0001$), including a greater number of inpatient (IP) hospitalizations, ED visits and OP visits (CHK vs. NK: 2.0 vs. 0.8, 1.8 vs. 0.9, 20.2 vs. 14.8, respectively, all $p<0.0001$; CHK vs. single-HK: 1.9 vs. 1.4 [$p<0.0001$], 1.9 vs. 1.6 [$p=0.0014$], 27.2 vs. 21.7 [$p<0.0001$], respectively). On average, patients with CHK also spent 19.7 and 9.6 more days in hospital stay annually than those with NK and single-HK, respectively (both $p<0.0001$).

Conclusion: CHK was associated with significantly higher all-cause medical costs and HRU compared with NK and single-HK. These findings highlight the substantial economic burden associated with HK (especially recurrent HK) and the need for effective long-term management strategies.

Keywords：Chronic Hyperkalaemia; All-Cause Medical Costs; Healthcare Resource Utilization

Table 1. All-cause medical costs and HRU in CHK vs. NK and vs. single-HK

Categories	CHK vs. NK		CHK vs. Single-HK	
	CHK cohort (N=6,971)	NK cohort (N=6,971)	CHK cohort (N=11,085)	Single-HK cohort (N=11,085)
Medical costs				
Total costs, ¥				
Mean (SD)	63,132 (107,606)	22,231 (33,105)	67,720 (109,446)	43,629 (66,838)
Difference in mean (95% CI)	40,902 (38,259–43,544)		24,091 (21,704–26,478)	
p value	<0.0001		<0.0001	
Hospitalization costs, ¥				
Mean (SD)	50,331 (104,094)	14,742 (30,744)	49,217 (105,335)	29,241 (61,814)
Difference in mean (95% CI)	35,589 (33,041–38,136)		19,977 (17,703–22,250)	
p value	<0.0001		<0.0001	
ED visit costs, ¥				
Mean (SD)	1,445 (4,373)	508 (1,295)	1,597 (4,967)	1,276 (4,211)
Difference in mean (95% CI)	937 (830–1,044)		321 (200–442)	
p value	<0.0001		<0.0001	
OP visit costs, ¥				
Mean (SD)	11,356 (18,429)	6,980 (9,928)	16,906 (29,482)	13,112 (23,746)
Difference in mean (95% CI)	4,376 (3,885–4,868)		3,793 (3,089–4,498)	
p value	<0.0001		<0.0001	
HRU				
Total HRU				
Mean (SD)	24.0 (24.6)	16.5 (16.2)	31.0 (38.2)	24.6 (30.4)
Difference in mean (95% CI)	7.5 (6.9–8.2)		6.4 (5.5–7.3)	
p value	<0.0001		<0.0001	
Number of IP hospitalizations				
Mean (SD)	2.0 (2.9)	0.8 (1.5)	1.9 (2.7)	1.4 (2.0)
Difference in mean (95% CI)	1.2 (1.2–1.3)		0.6 (0.5–0.6)	
p value	<0.0001		<0.0001	
Number of ED visits				
Mean (SD)	1.8 (5.9)	0.9 (2.4)	1.9 (6.4)	1.6 (6.1)
Difference in mean (95% CI)	0.9 (0.8–1.1)		0.3 (0.1–0.4)	
p value	<0.0001		0.0014	
Number of OP visits				
Mean (SD)	20.2 (22.9)	14.8 (15.5)	27.2 (37.4)	21.7 (29.5)
Difference in mean (95% CI)	5.4 (4.7–6.0)		5.6 (4.7–6.5)	
p value	<0.0001		<0.0001	
Annualized length of hospital stay (days)				
Mean (SD)	27.4 (53.7)	7.7 (20.3)	25.9 (49.4)	16.3 (34.9)
Difference in mean (95%CI)	19.7 (18.3–21.0)		9.6 (8.5–10.7)	
p value	<0.0001		<0.0001	

Abbreviations: CHK, chronic hyperkalaemia; CI, confidence interval; ED, emergency department; HK, hyperkalaemia; HRU, healthcare resource utilization; IP, inpatient; NK, normokalaemia; OP, outpatient; SD, standard deviation.

Poster Presentation：Electrolyte, Acid-Base, and Hypertension
Poster No.：C0410
Abstract Submission No.：APCN20250312

Magnesium Deficiency is associated with uncontrolled hypertension in Asians with Chronic Kidney Disease

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Abstract

Introduction: Serum magnesium (mmol/L) correlates poorly with total body magnesium, hence magnesium deficiency is difficult to diagnose in the chronic kidney disease (CKD) population. The factors responsible for magnesium deficiency is unclear in Asians. We used both serum Mg concentrations and 24-hour urinary magnesium excretion (24U-Mg, mmol/day) to identify magnesium deficiency in study participants and correlate deficiency to patient characteristics and comorbidities.
Methods: We collected serum Mg concentrations (mmol/L) and 24-hour urinary magnesium excretion (24U-Mg, mmol/day) for 335 participants (232 with CKD). We used combined thresholds of serum Mg and 24U-Mg to define risks of magnesium deficiency (1) [Table 1]. Severe Mg deficiency was defined as serum Mg <0.75 and 24U-Mg <1.65 g/day. We then compared patient comorbidities such as diabetes and hypertension, and patient characteristics such as age, gender, kidney function (GFR mL/min per 1.73 m2 measured using Tc99m DTPA), and blood pressure (BP, mmHg) across various states of magnesium deficiency. Analysis was done with ANOVA and $\chi 2$ test, and non-parametric Kruskal-Wallis test where requirements were not met.
Results: Patients with severe Mg deficiency (13, 5.6% of patients) were more likely to be women (61.5%, p <0.001), diabetic, (76.9% p = 0.042), or hypertensive (100%, p >0.001). Those with severe deficiency had higher BP (SBP 151.2 ± 26.9 mmHg, p = 0.005, DBP 78.7 ± 11.9 mmHg, p = 0.033), and lower GFR (48.9 ml/min/1.73m2 ± 21.6, p = 0.014) compared to other magnesium states. There were no significant associations between severe deficiency and ethnicity, loop diuretic use, or heart rate.
Conclusion: Severe magnesium deficiency and magnesium insufficiency are common in patients with CKD and may be undetected using serum Mg alone. Our study showed an association between magnesium deficiency and higher systolic BP, diabetes, lower GFR, and female gender. We recommend that studies use the strict definition to identify the incidence and prevalence of magnesium deficiency in pre-dialysis CKD patients in epidemiology and intervention studies.

Keywords：magnesium, hypertension, ckd,

Table 1:

Reference ranges for various degrees of magnesium deficiency.

Percentage of patients in each magnesium category			
	24UMg (mmol/day)		
Serum Mg	=< 1.65	1.66-3.29	> 3.29
=< 0.75	Severe deficiency	Insufficiency	Insufficiency
0.76-0.85	Insufficiency	Insufficiency	Likely replete
>= 0.86	Insufficiency	Likely replete	Normal

Poster Presentation：Electrolyte, Acid-Base, and Hypertension
Poster No.：C0411
Abstract Submission No.：APCN20250386

Prognostic Impact Of Hyponatremia In COVID-19 Pneumonia Patients Admitted In A Tertiary Hospital: A Single Center Retrospective Cohort Study

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Abstract
Background: Hyponatremia is common among COVID-19 patients and is associated with increased morbidity and mortality. The prevalence ranges from 28.1% (Atila et al., 2021) up to 45.8% (Ayus et al., 2021). Studies show an association of hyponatremia to disease progression, length of hospital stay, need for mechanical ventilation and patient survival among COVID-19 patients. This study highlighted the impact of hyponatremia in terms of prognosis in the local setting.

Objectives: This main objective is to determine the prognostic impact of hyponatremia in COVID-19 patients admitted in Western Visayas Medical Center (WVMC) from October 1, 2021 – March 31, 2022. The specific objectives are to determine the prevalence, to compare the demographic and clinical profile of hyponatremic and normonatremic COVID-19 patients and to determine the association of hyponatremia to clinical outcomes as to disease progression, length of hospital stay, respiratory failure with need for mechanical ventilation and survival.

Methodology: This single center, retrospective observational cohort study involved 428 admitted COVID-19 patients over a 6-month period. Categorical variables were expressed as frequency, rates and percentages while continuous variables were described using mean and standard deviation. Chi-Square test or Fisher's Exact Test was used to determine bivariate relationship between having hyponatremia and the clinical outcomes. Student's T-test or Mann-Whitney test compared the average length of hospital stay or other categorical variables between those with or without hyponatremia. Multiple logistic regression simultaneously analyzed the effect of having hyponatremia and other variables on the clinical outcomes. Survival analysis via Kaplan-Meier survival curves and estimated medians were utilized to compare the mortality of patients with or without hyponatremia.

Results: On admission, 48.13% COVID-19 patients were hyponatremic, mostly male patients and on >61 years age group. On co-morbidities, hypertension was the most common. Among inflammatory markers, higher mean LDH, CRP, serum ferritin and D-dimer were noted on hyponatremic group while procalcitonin was lower compared to normonatremic group. In terms of clinical outcomes, length of hospital stay had a significant association with hyponatremia (p=0.004). Disease progression, need for mechanical ventilation and survival between hyponatremic and normonatremic did not differ.

Conclusion: High prevalence of hyponatremia was noted among admitted patients. In terms of clinical outcomes, hyponatremic COVID-19 patients had longer hospital stay which conferred with other international studies. This connotes early management of hyponatremia may significantly decrease patients' hospital stay.

Keywords：Hyponatremia; Prognostic Impact; COVID-19

Poster Presentation：Electrolyte, Acid-Base, and Hypertension
Poster No.：C0413
Abstract Submission No.：APCN20250446

Adrenocortical Carcinoma In A Young Women With Clinical Manifestation Of Hypertension And Hyperkalemia

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Abstract

Introduction: Adrenocortical carcinoma (ACC) is a rare adrenal malignancy with an incidence reported to range from 0.7-2 cases per million population per year. Approximately 60 % of ACC presents as a functional tumor and in this group only 2% manifest as hyperaldosteronism.

Methods: Observational

Results: A 36-year-old woman with recurrent hospitalization due to weakness of the limbs. Physical and laboratory examinations showed hypertension, hypokalemia, metabolic alkalosis, aldosterone excess and increased aldosterone renin ratio (ARR). MSCT abdominal results with contrast showed suggestive adrenal tumor. Subsequently, Adrenalectomy was performed with histopathological results of adrenocortical carcinoma with infiltration into the connective and fat tissue, so they were classified as T3N0M0. This patient did not have symptoms of Cushing's syndrome and virilization. After adrenalectomy, the patient showed clinical and laboratory improvements.

Conclusion: We have reported a case ACC that occurred in 36-year-old woman with clinical manifestations of hyperaldosteronism.

Keywords：Adrenocortical carcinoma, Hyperaldosteronism, Hypertension, Hypokalemia

Poster Presentation：Electrolyte, Acid-Base, and Hypertension
Poster No.：C0414
Abstract Submission No.：APCN20250474

Central diabetes insipidus in an older adult with a hypercoagulable state following severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection.

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Abstract

Background

COVID-19 has been associated with both pulmonary and extrapulmonary complications, including cardiovascular, neurological, and other systemic disorders. Neurological complications may occur through mechanisms such as entry via the olfactory nerve, vascular endothelial infection, and disruption of the blood–brain barrier due to inflammation. Among these complications, central diabetes insipidus (DI) has been identified as a potentially treatable complication of COVID-19. Here, we present a case of rapid-onset central DI in an 80-year-old woman following COVID-19.

Case presentation

An 80-year-old woman with a complex medical history developed symptoms of polyuria, characterized by a 24-h urine output of 4.4 L, following a confirmed COVID-19 infection. Her urine osmolality was measured at 666 mOsm/kg, and this finding was inconsistent with the typically low urine osmolality observed in DI. However, this discrepancy was attributed to a possible prerenal acute kidney injury. Notably, significant improvement in her symptoms was observed following the administration of desmopressin. Based on her clinical response to treatment, the patient received a diagnosis of central DI.

Conclusions

This case highlights the occurrence of central DI as a complication following COVID-19 infection, potentially linked to a hypercoagulable state. Although the precise pathophysiological mechanism remains unclear, this report underscores the need for further research to elucidate the relationship between COVID-19, the hypothalamic–pituitary axis, and the development of central DI.

Keywords：Central diabetes insipidus, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), D-dimer, hypercoagulation.

Poster Presentation：Electrolyte, Acid-Base, and Hypertension
Poster No.：C0415
Abstract Submission No.：APCN20250486

Maintaining Blood Pressure in the Indonesian Community: Do Community-Based Health Centers (Puskesmas) Play an Important Role? A Retrospective Cohort Study

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Abstract

Introduction

Non-communicable diseases (NCDs), especially hypertension and cardiovascular disease, are the leading cause of mortality worldwide. Hypertension is predicted to impact approximately 1.6 billion individuals by 2025. The Indonesian government has developed a community-based intervention to control NCDs called community-based health centers (Puskesmas). This study aims to determine the impact of Puskesmas on maintaining blood pressure in the Indonesian community.

Methods

The design of this study was a retrospective cohort study using secondary data from Puskesmas in Kendal Regency, Central Java Province, Indonesia. Participants over 20 years old were included in this study. The data was collected during the period from January 2020 to August 2021. This study compared blood pressure at the first visit to Puskesmas and after follow-up in Puskesmas. The statistical analysis was conducted using SPSS 25.

Results

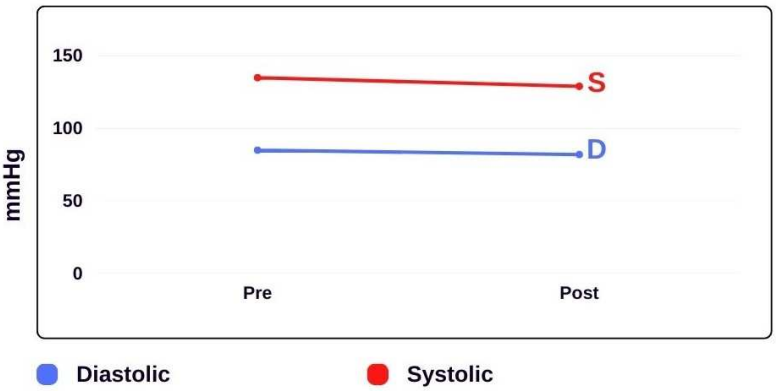
A total of 40 participants, ranging in age from 21 to 70 years, were included in this study, including 22 females (55%) and 18 males (45%). The mean age of the participants was 48 years. The blood pressure average at the first visit was 135/85 mmHg, and it turned to 129/82 mmHg after several visits to Puskesmas. The analysis of the data using the Shapiro-Wilk test showed that the distribution was not normal. The statistical analysis using the Wilcoxon signed-rank test showed insignificant results for both systolic and diastolic blood pressure ($p = 0.06$ for systolic and $p = 0.205$ for diastolic). A change in blood pressure occurred, although it was statistically insignificant.

Conclusion

Puskesmas was not effective in maintaining blood pressure in Kendal Regency, Indonesia.

Keywords：community-based health center, blood pressure, hypertension

Graph 1. A blood pressure graph at the first visit and after several visits to Posbindu



Poster Presentation：Electrolyte, Acid-Base, and Hypertension
Poster No.：C0416
Abstract Submission No.：APCN20250493

A Brief Discussion on the Clinical Application of Blood Purification Therapy

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Abstract
This article is based on treatment cases from a medical center in southern Taiwan in 2023. The purpose of this paper is to explore the clinical applications and care experiences of Plasma Exchange (PE) and Double Filtration Plasmapheresis (DFPP), analyzing the principles of operation, indications, common complications, and their management for these two techniques. The paper also presents the annual treatment frequency and diagnostic distribution.

PE and DFPP are important blood purification therapies widely used in neurology, rheumatology, hematology-oncology, and nephrology, commonly applied in the treatment of diseases such as systemic lupus erythematosus, myasthenia gravis, acute nephritis, and antibody-mediated rejection after organ transplantation.

According to statistics, our unit performed a total of 872 treatments in 2023, with myasthenic crisis and Guillain-Barré syndrome being the most common indications. The article mainly discusses key nursing care points before, during, and after treatment, emphasizing the importance of reducing complications and maintaining nurse-patient relationships.

It is hoped that this study will provide practical references for frontline clinical caregivers and promote interprofessional team cooperation to jointly improve patient safety and care quality.

Keywords：(Plasma Exchange、PE)(Double Filtration Plasmapheresis、DFPP)

Poster Presentation：Electrolyte, Acid-Base, and Hypertension
Poster No.：C0417
Abstract Submission No.：APCN20250519

Exploring Barriers To Using A Cuffed 24-hour Ambulatory Blood Pressure Monitoring In A Tertiary Hospital Outpatient Setting In Singapore

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Abstract

Introduction:

Ambulatory blood pressure (ABP) measurements are more accurate than single blood pressure readings in the outpatient setting. ABP is widely recommended by international guidelines to identify patients with white coat or masked hypertension, nocturnal hypertension and resistant hypertension and to guide the titration of anti-hypertensive agents. However, the uptake of ABP using multi-use, cuffed devices in our institution remains limited. Furthermore, we found that 15% of patients did not have adequate ABP measurements over 24 hours, rendering the need for repeat testing. This study thus aimed to explore the experience of and barriers faced by patients and healthcare providers when using cuffed ABP devices in a tertiary hospital.

Methods:

This qualitative study was conducted from September to October 2024 at Department of Renal Medicine, Singapore General Hospital. We recruited patients who had previously undergone ABP evaluation with cuffed devices, nephrologists who had utilised the service and technicians who managed the service. Interviews were conducted by a trained researcher using semi-structured interview guides. The interviews were audio-recorded, transcribed verbatim, checked and coded. The transcripts were analyzed thematically using NVivo software.

Results:

A total of six patients, 11 physicians and two laboratory technicians were interviewed. Several barriers were identified. Firstly, patients experienced discomfort wearing a cuffed APB device; they reported tightness and pain during cuff inflation during the day and night so that sleep was disturbed; some on blood thinners even experienced bruises. Secondly, wearing of the cuff affected daily routines like showering and outdoor activities that added to patients' inconvenience. Thirdly, loose cuffs, when not inflated, could slide down the arm. Frequent re-positioning was not only cumbersome, but also risked inappropriate positioning and hence missed ABP measurements.
Physicians shared that ABP results were useful to counsel patients on their hypertension control and justify adjustments of anti-hypertensive agents. However, patients who had reported discomfort with the cuffed ABP device tended to question the reliability of the ABP results, hence limiting its clinical utility in patient education.

Conclusion:

This study identified several device- and patient-related factors that limited the utility of the cuffed ABP devices. Alternative cuffless ABP devices may circumvent some of these challenges experienced.

Keywords：Hypertension, ambulatory blood pressure, qualitative study

Poster Presentation：Electrolyte, Acid-Base, and Hypertension
Poster No.：C0418
Abstract Submission No.：APCN20250652

The Value of Spot and 24-Hour Urine for Potassium Excretion Rate in Hypokalemic Periodic Paralysis

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Abstract

Background: Hypokalemic periodic paralysis (HypoKPP) is a potentially life-threatening emergency that requires rapid diagnosis and management. The diagnostic and therapeutic value of spot versus 24-hour urine for HypoKPP has not been thoroughly evaluated.

Methods: We consecutively investigated the patients with HypoKPP who completed the collection of both spot and 24-hour urine for electrolytes excretion rate over 5 years. Their clinical and laboratory characteristics, and potassium (K+) supplementation to correct hypokalemia were analyzed. Spot urine K+ excretion was calculated by transtubular K+ concentration gradient (TTKG) and K+-creatinine ratio (K+/Cr). K+ supplementation – 24-hour urine K+ was assessed for K+ balance. Pure K+ shift was defined as a negative K+ balance, and the co-existing K+ deficit as a positive K+ balance.

Results: Sixty-two HypoKPP male patients primarily including thyrotoxic periodic paralysis (TPP) had an average age of 36 years and serum K+ 2.2 ± 0.5 mmol/L. Most of them (89 %, n=55) had a low TTKG (< 3) or K+/Cr ratio (< 0.18 mmol/L/mg/dL) in spot urine, but all had higher (> 20 mmol/day) 24-hour urine K+ excretion (61.7 ± 34.2 mmol/day) with average of K+ supplementation (77.0 ± 45.3 mmol). Twenty-four patients (39 %) with negative K+ balance (negative 33.3 ± 20.0 mmol/day; K+ supplementation 46.7 ± 28.8 mmol and 24-hour urine K+ excretion 79.9 ± 38.1 mmol/day) had pure K+ shift. However, 38 patients (61 %) with positive K+ balance (positive 45.9 ± 37.0 mmol/day; K+ supplementation 96.1 ± 43.6 mmol and 24-hour urine K+ excretion 50.1 ± 25.9 mmol/day) had co-existing K+ deficit. Compared to the patients with pure K+ shift, those with co-existing K+ deficit had significantly lower serum K+ (2.1 ± 0.5 vs 2.4 ± 0.4 mmol/L, $p < 0.05$), lower 24-hour urine K+ excretion, but needed more K+ supplementation with a higher rebound hyperkalemia rate (13.1 % vs 4.1 %).

Conclusions: Timely spot urine for K+ excretion better represents the pathophysiological state, however, 24-hour urine K+ excretion aids in K+ balance evaluation, revealing the co-existing K+ deficit in HypoKPP.

Keywords：Hypokalemic periodic paralysis, potassium balance, urine potassium excretion

Poster Presentation：Electrolyte, Acid-Base, and Hypertension
Poster No.：C0419
Abstract Submission No.：APCN20250671

Juxtaglomerular cell hyperplasia in pseudo-Gitelman syndrome

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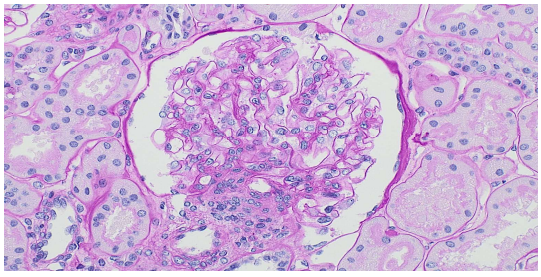
Abstract

Juxtaglomerular (JG) cells are specialized smooth muscle cells located in the walls of the afferent arterioles of the kidney. They are primarily responsible for the synthesis and secretion of renin, which regulates blood pressure and fluid balance through the renin-angiotensin-aldosterone system. A decrease in renal blood flow, sensed by the JG cells, stimulates increased renin secretion, and chronic renal hypoperfusion is associated with JG cell hyperplasia. We recently proposed that pseudo-Gitelman syndrome should be considered a distinct clinical entity [Electrolyte Blood Press. 2023;21:72–76]. Gitelman syndrome is typically characterized by hypocalciuria, whereas Bartter syndrome is usually associated with hypercalciuria. JG cell hyperplasia is a hallmark of Bartter syndrome but is usually mild in Gitelman syndrome. Here, we report a case of pseudo-Gitelman syndrome with marked JG cell hyperplasia confirmed by renal biopsy, performed 12 years after the initial presentation of hypokalemic metabolic alkalosis and hypocalciuria. The patient's laboratory values were as follows: serum sodium 136 mmol/L, serum potassium 2.5 mmol/L, serum chloride 79 mmol/L, arterial blood pH 7.62, plasma bicarbonate 52 mmol/L, BUN 15.3 mg/dL, serum creatinine 0.85 mg/dL, urine sodium 89 mmol/L, urine potassium 95 mmol/L, urine chloride 52 mmol/L, and urine calcium-to-creatinine ratio 0.06. Her blood pressure was 90/60 mmHg. Plasma renin activity was markedly elevated at 36.6 ng/mL/h (normal: 0.32–1.84), and serum aldosterone was 37.2 ng/dL (normal: 4.2–20.9). There was no evidence of diuretic or laxative abuse or self-induced vomiting. The metabolic alkalosis was saline-responsive. Initial sequencing of SLC12A3, CLCKNB, and KCNJ10 genes revealed no mutations, and whole-exome sequencing showed no pathogenic variants. The patient did not adhere to outpatient care and was readmitted over ten times across a decade for episodes of paraparesis and/or syncope. Eventually, a renal biopsy was performed, revealing minor glomerular changes along with mild interstitial inflammation and fibrosis. However, remarkable JG cell hyperplasia was noted in glomeruli (Figure). This case supports the classification of pseudo-Gitelman syndrome as a distinct entity, and its underlying etiologies warrant further investigation.

Keywords：Hypokalemia, Juxtaglomerular cell hyperplasia, Metabolic alkalosis, Pseudo-Gitelman syndrome.



Poster Presentation：Electrolyte, Acid-Base, and Hypertension
Poster No.：C0420
Abstract Submission No.：APCN20250710

Clinical Characteristics and Management in Patients with Concurrent Hyperkalemia and Bradycardia: The Added Value of Artificial Intelligence–enabled Electrocardiography

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Abstract

Background:

Concomitant hyperkalemia and bradycardia as a more life-threatening urgency require rapid and appropriate management. Artificial intelligence-enabled electrocardiography (AI-ECG) has been developed to detect hyperkalemia and bradycardia rapidly. The aim of this study was to evaluate clinical characteristics, management, and AI-ECG application in patients with hyperkalemia and bradycardia.

Methods:

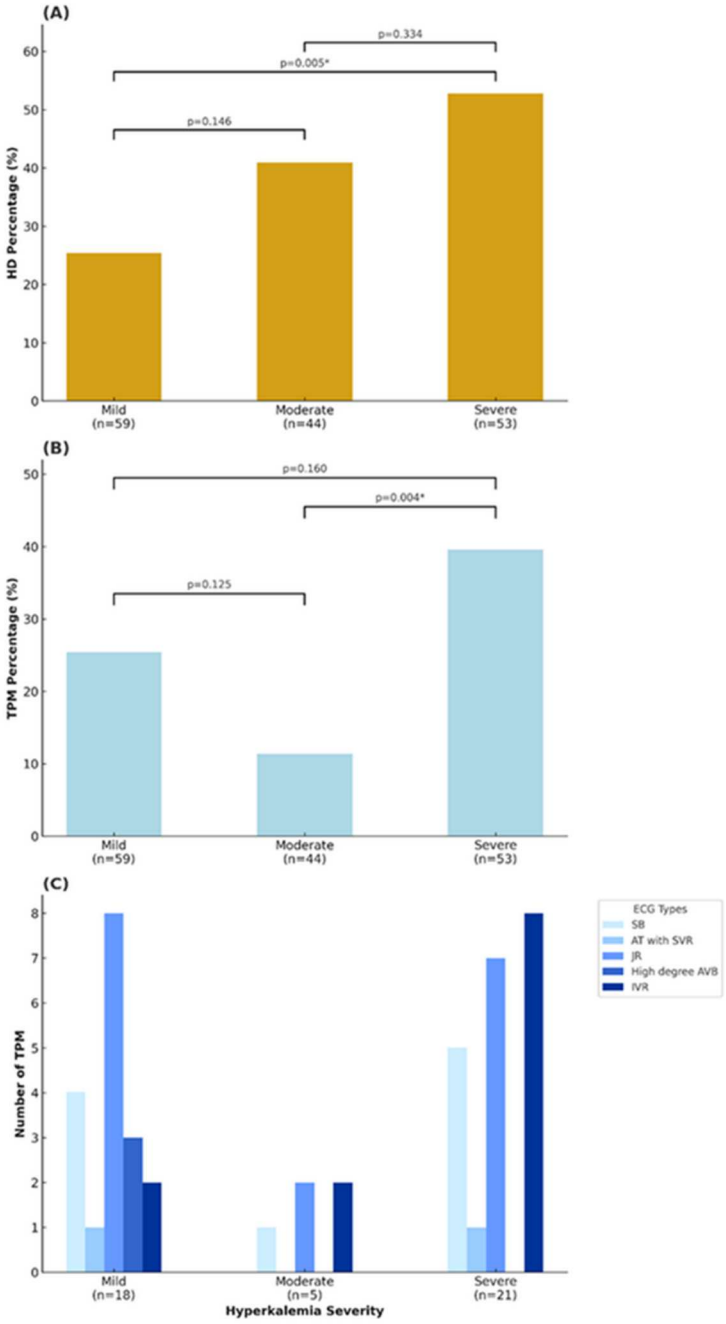
This retrospective cohort study was performed in the emergency department (ED) of a single academic medical center over an 8-year period. Patients with both hyperkalemia > 5.5 mmol/L and electrocardiography (ECG) showing bradycardia less than 50 beats/min were included for analysis. Both cardiologists and nephrologists were consulted for the evaluation of transient pacemaker placement (TPM) and emergent hemodialysis (HD). Patients' characteristics, clinical features, and treatment were examined. The ECG-K+ hyperkalemia was defined as an AI-ECG-K+ value of ≥ 5.5, as quantified by ECG12Net analysis.

Results:

A total of 156 patients (mean age 78.6± 11.7 years and male: female 62:94) who met the inclusion criteria were categorized into mild (5.5-5.9 mmol/L, n=59), moderate (6.0-6.4 mmol/L, n=44), and severe hyperkalemia (≥ 6.5 mmol/L, n=53) groups. The cohort exhibited a mean heart rate of 39.6 ± 8.1 beats per minute, with severe bradyarrhythmia, including junctional rhythm (JR), high-degree atrioventricular (AV) block, or idioventricular rhythm (IVR), present in 56.4% (88/156) of patients. Most of them had chronic kidney disease (CKD), acute kidney injury (AKI), and regular hemodialysis (HD). Approximately 51% of them received AV node blockades. For bradycardia, JR was the most common among three groups but high-degree AV block and IVR were predominant in mild and severe hyperkalemia, respectively. Emergent HD was significantly higher in patients with severe hyperkalemia (45.9%, 28/61) but was also performed in cases of mild hyperkalemia with non-hyperkalemic uremic complications (19.7%, 12/61). TPM use was most common among patients with JR (38.6%, 17/44) and IVR (27.3%, 12/44), particularly in mild and severe hyperkalemia. For AI-ECG to predict hyperkalemia, the sensitivity for mild, moderate, and severe hyperkalemia was 74.6%, 88.6%, and 96.2%, respectively. Compared to those with false-negative ECG-K^+ (n=22), patients with positive ECG-K^+ (n=134) had a significantly higher percentage of emergent HD (43.3% vs. 13.6%, $p<0.05$), particularly in mild hyperkalemia.

Conclusion:
In addition to severe hyperkalemia, emergent HD and TPM are frequently performed in mild hyperkalemia with concurrent non-hyperkalemic uremic complications and junctional rhythm, respectively. AI-ECG helps predict hyperkalemia and offers decision support for patients with mild hyperkalemia and bradycardia.

Keywords：Hyperkalemia, Bradycardia, Artificial-intelligence, electrocrdiography



Poster Presentation：Electrolyte, Acid-Base, and Hypertension
Poster No.：C0421
Abstract Submission No.：APCN20250719

The interplay of Cardio-renal metabolism among adults of North India diagnosed with essential hypertension

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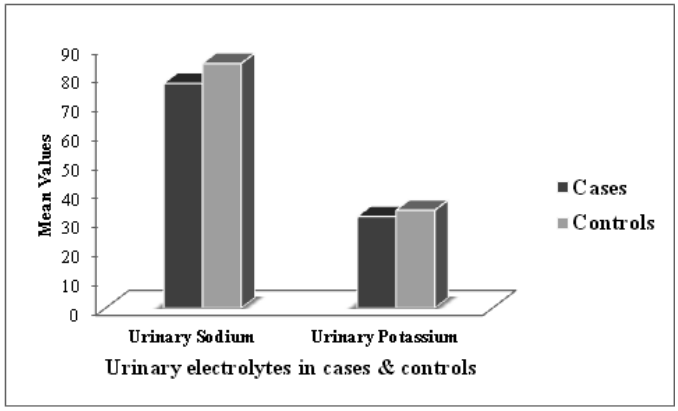
Introduction: EH stands as a crucial modifiable risk factor for renal and cardiovascular diseases, representing the foremost underlying cause of global mortality and morbidity. The development of EH is a multifaceted and highly intricate condition. The kidney serves as both a contributor and a target organ in the processes of hypertension, with the diseases arising from the interaction of various organ systems and a multitude of independent or interdependent mechanisms. Mutation in the ADD1 gene can enhance the activity of sodium and potassium-ATPase (ATPase) in renal tubular cells, leading to increased sodium reabsorption in the kidney, which ultimately contributes to hypertension.

Objective: To evaluate the lipid profile and Electrolyte levels (Sodium and Potassium in Serum and Urine) in EH and in healthy controls in North Indian Population. Methodology: A total of 166 age and sex matched essential hypertensive and healthy controls were included in our study from outpatient department (OPD) of Medicine in King George Medical University, Lucknow, India. First group consisting of 91 subjects were Known EH (B.P ≤ 139/89mm of Hg). Another group consisting of 75 subjects was healthy controls (B.P ≤ 120/80mm of Hg). Fasting venous blood sample was collected from all the subjects in plain vacutainers and the sample was centrifuged for the estimation of lipid profile and Serum Sodium (Na+) & Potassium (K+). Lipid profile was measured with an automated analyzer and Electrolytes was measured using ion-selective electrolyte auto-analyzer in the Clinical lab of biochemistry, KGMU.

Results: Most of the control subjects had normal lipid profile levels. In patients with EH there was a significant increase in serum Cholesterol (216.1 + 2.77 – 150.6 + 1.183, $p<0.0001$), LDL Cholesterol (81.22 + 0.483 – 67.94 + 1.081, $p<0.0001$) and Triglycerides (172.9 + 1.094 – 86.07 + 0.963, $p<0.001$). HDL Cholesterol (43.76 + 0.49 – 49.25 + 1.204, $p<0.0001$) is also significant reduced as compared to controls. No significant difference was found in serum Na+ and K+ level. The Urinary Na+ (87.78 + 1.307 – 125.1 + 1.55, $p<0.0001$) levels were significantly lower in E. hypertensive patients when compared to controls while differences in Urinary K+ levels were not significant.

Conclusion: We conclude that dyslipidemia & urinary Na+ is associated with essential hypertension and this may due to the genetic predisposition of alpha ADD1 & AGT gene, Modern lifestyle and disturbed circadian rhythm is the main culprit for this Silent Killer or idiopathic disease.



Keywords：Essential Hypertension, Silent Killer, Cardio-Renal disease

Poster Presentation：Electrolyte, Acid-Base, and Hypertension
Poster No.：C0422
Abstract Submission No.：APCN20250745

From Blood Pressure to Brain Function: Unravelling the Influence of Interleukin-6 and Physical Performance in Hypertension

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Abstract

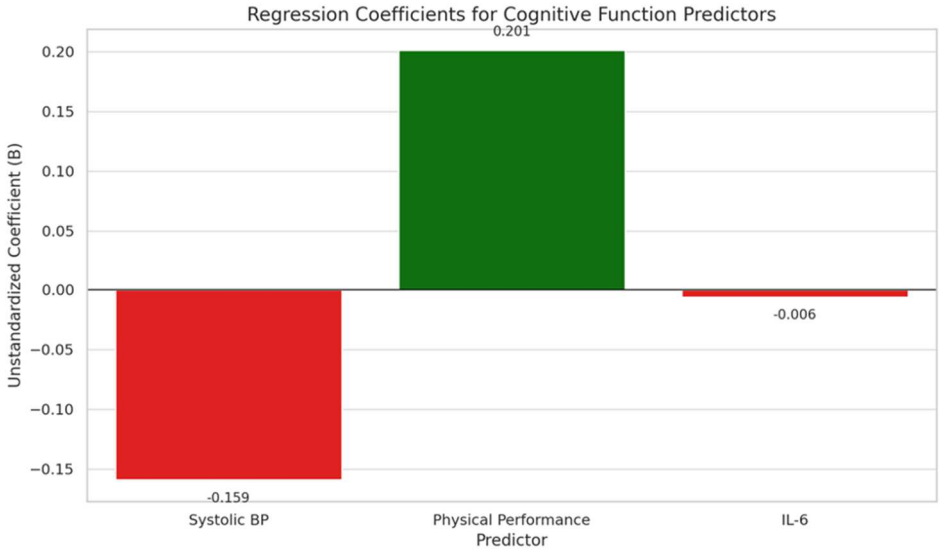
Introduction: Cognitive impairment in older adults is frequently associated with vascular dysfunction and systemic inflammation. Among pro-inflammatory markers, Interleukin-6 (IL-6) has emerged as a potential mediator of neurodegeneration, particularly in hypertensive individuals. This study aimed to investigate the relationship between IL-6, physical performance, blood pressure, and cognitive function in a geriatric population.

Methods: A cross-sectional study was conducted from April to June 2024 at the geriatric clinic of Dr. Moewardi General Hospital, Surakarta, Indonesia, involving 41 elderly participants. Cognitive function was assessed using the Indonesian version of the Montreal Cognitive Assessment (MoCA-INA). Independent variables included serum IL-6 levels, systolic blood pressure, and physical performance, measured via the Five Times Sit-to-Stand Test (5xSTS). Multiple linear regression analysis was performed to identify significant predictors of cognitive performance.

Results: A one-unit increase in physical performance was associated with a 0.201-point improvement in cognitive function ($p = 0.040$; $R^2 = 0.099$). Each one-unit increase in IL-6 corresponded to a 0.006-point decline in cognitive function ($p = 0.037$; $R^2 = 0.025$). Additionally, each one-unit rise in systolic blood pressure was associated with a 0.159-point decrease in cognitive function ($p = 0.027$; $R^2 = 0.749$). When combined, physical performance, systolic blood pressure, and IL-6 collectively explained 75.3% of the variance in cognitive function (adjusted R^2), with the remaining 24.7% attributable to other factors.

Conclusion: These findings suggest that cognitive performance in older adults is significantly influenced by systolic blood pressure, physical performance, and systemic inflammation, as indicated by IL-6 levels. Among these, systolic blood pressure emerged as the strongest predictor, underscoring the importance of cardiovascular health in preserving cognitive integrity. The data also highlight the potential protective role of muscle strength and the harmful effects of inflammation. Given the multifactorial nature of cognitive decline, a comprehensive approach involving blood pressure control, physical activity promotion, and inflammation management is recommended. Further longitudinal studies with larger sample sizes are needed to clarify causal pathways and guide targeted interventions.

Keywords：Keywords: Cognitive impairment; Interleukin-6; Hypertension; Aging; Inflammation; Geriatric cognition; MoCA



Poster Presentation：Electrolyte, Acid-Base, and Hypertension
Poster No.：C0423
Abstract Submission No.：APCN20250815

The Interplay among Seasonal Blood Pressure Variability and Outcomes in Patients with Chronic Kidney Disease

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Abstract

Background and hypothesis. Seasonal blood pressure (BP) variability is common among patients with chronic kidney disease (CKD). We investigated the relationship between patterns of seasonal BP variability and cardiorenal outcomes in CKD patients.

Methods. A retrospective observational cohort study was conducted. CKD patients followed up in the nephrology outpatient clinic between 2014 and 2019 were enrolled and grouped according to the patterns of seasonal BP variability. Patient outcomes included estimated glomerular filtration rate (eGFR) decline rate and individual as well as composite cardiovascular outcomes.

Results. Among 522 patients, 140 patients (26.8%) had winter hypertension, 51 patients (9.8%) had summer hypertension and 331 (63.4%) patients had stable BP throughout the year regardless of seasonal change. CKD patients with summer hypertension had significantly higher rates of eGFR decline compared to other patterns of seasonal BP variability [summer hypertension, 3.76 (0-3.48) vs. winter hypertension, 3.01 (0.91-4.21) vs. stable BP, 2.35 (0-3.27); p = 0.004]. CKD patients with winter hypertension had significantly higher risk for myocardial infarction (MI) and major adverse cardiovascular events (MACE) compared to other groups [MI: winter hypertension, 20.7% vs. summer hypertension, 15.7% vs. stable BP, 7.9%; p = 0.03; MACE: winter hypertension, 23.6% vs. summer hypertension, 19.6% vs. stable BP, 9.1%; p = 0.019]. Summer hypertension was associated with steeper kidney function decline [hazard ratio (HR) = 2.75, 95% confidence interval (CI) = 1.47-5.22, p<0.001], while winter hypertension is significantly associated with MACE (HR = 2.19, 95% CI = 1.12-4.22, p = 0.011).

Conclusion. There is an important and complex interplay between seasonal BP variability and cardiorenal outcomes in CKD patients. Summer hypertension is associated with poorer kidney outcomes while winter hypertension is associated with poorer cardiovascular outcomes.

Keywords：chronic kidney disease, seasonal blood pressure variability, cardiorenal outcomes

Poster Presentation：Electrolyte, Acid-Base, and Hypertension
Poster No.：C0424
Abstract Submission No.：APCN20250871

Hypokalemia and Risk of Spontaneous Bacterial Peritonitis and Mortality in Patients with Liver Cirrhosis: A Propensity-Matched Real-World Cohort Study

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Abstract

Background & Aims: Hypokalemia is a common yet understudied electrolyte disturbance in cirrhosis. We investigated its association with spontaneous bacterial peritonitis (SBP), all-cause mortality, and healthcare utilization in a large real-world cohort.

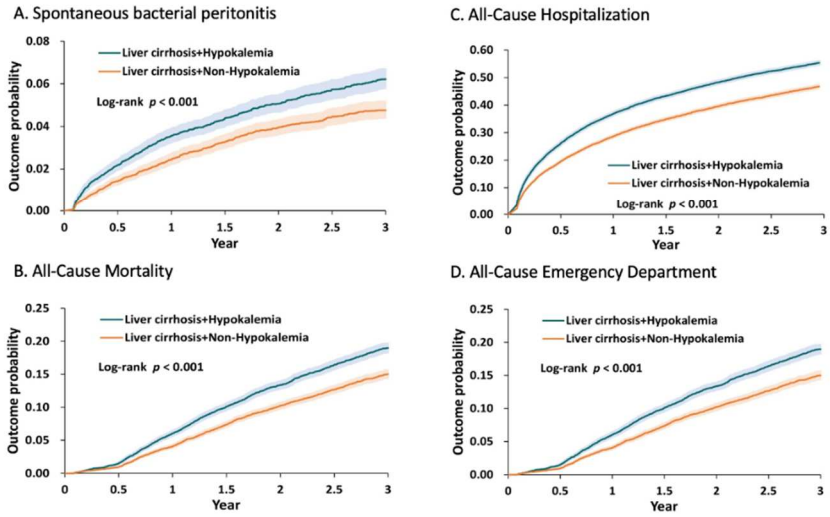
Methods: A retrospective cohort study using the TriNetX Global Research Network (2013–2023) identified adult cirrhotic patients stratified by serum potassium (<3.5 vs. ≥3.5 mmol/L). Propensity score matching (1:1) was applied. Outcomes were assessed at 6-months to 3-year follow-up, with subgroup analyses by potassium severity.

Results: Among 62,376 matched patients, hypokalemia was associated with significantly higher 3-year incidence of SBP (6.22% vs. 4.76%; HR 1.33, 95% CI 1.18–1.50), all-cause mortality (18.98% vs. 15.02%; HR 1.31, 95% CI 1.23–1.41), hospitalization (55.59% vs. 47.07%; HR 1.31, 95% CI 1.26–1.36), and emergency department visit (41.27% vs. 33.78%; HR 1.33, 95% CI 1.27–1.39). These associations were consistent across follow-up periods from 6 months to 3 years. Kaplan–Meier analysis demonstrated early and sustained separation between groups (log-rank $p < 0.001$ for all outcomes). A dose-response trend was observed, with the highest risks among patients with potassium <3.0 mmol/L. Notably, among patients who developed SBP, those with hypokalemia had a strikingly higher 3-year recurrence rate (20.4% vs. 3.6%; HR 6.51, 95% CI 3.40–12.48).

Conclusion: This is the first large-scale study identifying hypokalemia as an independent risk factor for SBP, mortality, and healthcare burden in cirrhosis. Routine potassium monitoring and timely correction may help prevent SBP recurrence and improve outcomes.

Keywords：Hypokalemia, Liver Cirrhosis, Spontaneous Bacterial Peritonitis, Mortality

Figure 1. Kaplan–Meier curves showing cumulative incidence of spontaneous bacterial peritonitis (A), all-cause mortality (B), all-cause hospitalization (C), and emergency department visit (D) in patients with liver cirrhosis, stratified by baseline serum potassium (<3.5 vs. ≥3.5 mmol/L). Across all outcomes, patients with hypokalemia demonstrated significantly higher risks, with early and persistent separation of survival curves (log-rank $p < 0.001$ for all comparisons).



Poster Presentation：Electrolyte, Acid-Base, and Hypertension
Poster No.：C0425
Abstract Submission No.：APCN20250887

Prevalence and Profile of Hypertension Detected by Ambulatory Blood Pressure Monitoring in Non-Dialysis Children

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Introduction: Pediatric hypertension is one of the leading causes of childhood mortality. Variability in office blood pressure (BP) levels in children led to potential errors in diagnosis, staging, and management of hypertension. Ambulatory Blood Pressure Monitoring (ABPM) is a method of measuring BP over a 24-hour observation period, which led to more accurate blood pressure readings compare to office measurement.
Aim: To describe the prevalence and profile of ABPM and to compare ABPM parameters between target organ damages (TOD).
Methods: an observational, cross-sectional study conducted at dr. Cipto Mangunkusumo Hospital (CMH) between January to December 2024. The study population consisted of pediatric patients with hypertension who had not undergone dialysis. Inclusion criteria were: age 6-18 years, diagnosed with hypertension using ABPM criteria. The exclusion criteria was an incomplete ABPM recording (<70% readings). Standard deviation scores (SDS) BP was calculated by using https://www.ceddcozum.com/BloodPressure/Abpm. Data analysed in this study included ABPM data, office BP, clinical data, laboratory results, and echocardiographic findings, collected within two months of the ABPM examination.
Results: Total of 40 participants were recruited in this study. The mean age of the participants was 14.37 years (SD 2.18). The most common indication ABPM was evaluation antihypertensive drug treatment. The mean systolic SDS ABPM were higher compare to office blood pressure (1.73 (SD 1.67) vs 1.57 (SD 0.84)) and the mean ABPM diastolic SDS was higher compare to office BP (1.27 (SD 1.83 vs 1,07 SD (0,98). Total of 24/40 subjects (60%) were found to have hypertension based on ABPM. This study showed a significant disparity between the mean BP measurements by ABPM and office BP. The non-dipper group with kidney disease showed a higher prevalence and greater severity of target organ damage compared to those without kidney disease. This group had a higher prevalence of poor E/A ratio (23.52% vs. 11.76%), left ventricular hypertrophy (29.41% vs. 17.64%), and albuminuria (16.67% vs. 6.67%). Clinical laboratory data demonstrated more significant TOD in kidney disease, as indicated by higher uPCR levels (335.87 (SD 251.89) vs. 176.62 (SD 111.87)) and lower eGFR values (80.81 (SD 28.52) vs. 102.72 (SD 34.39)).
Conclusion: This study revealed difference in blood pressure result obtained from ABPM compared to office setting. The non-dipping patients with kidney disease had higher prevalence and higher severity of TOD compared to non-kidney disease patients.
Keywords：ABPM, hypertension, dipping status

Comparison of target organ damage between renal and non-renal disease in non-dipper groups

TOD	n	Kidney Disease	Non-Kidney Disease
a. SDS systolic	40	1,95 SD 2,20	1,41 SD 1,37
b. SDS diastolic	40	1,77 SD 2,29	0,72 SD 2,29
c. Ejection Fraction	17	72,86 SD 5,92	79,5 SD 8,34
d. LVH	17	5 (29.41%)	3 (17.64 %)
e. E/A Ratio <1 or >2	17	4 (23.52%)	2 (11.76%)
f. Protein/Creatinine Ratio	30	355,87 SD 251,89	176,62 SD 111,87
g. eGFR	40	80,81 SD 28,52	102,7 SD 34,39
h. Albuminuria	30	5 (16.67%)	2 (6.67%)
i. Kidney abnormality based on USG	20	8 (100%)	0

*Albuminuria based on semiquantitative ≥+2

Poster Presentation：Electrolyte, Acid-Base, and Hypertension
Poster No.：C0426
Abstract Submission No.：APCN20250893

Gut Microbiota-Derived TMAO: A Predictive Factor of Cardiovascular Disease and Albuminuria in Aldosterone-Producing Adenoma?

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Abstract

Introduction: Trimethylamine N-oxide (TMAO) is a biologically active molecule produced by the gut microbiome. There is accumulating evidence suggesting a strong association between high plasma TMAO levels and an increased risk of cardiovascular disease and chronic kidney disease. Patients with primary aldosteronism (PA) are more susceptible to cardiovascular and kidney events than patients with essential hypertension (HTN). Therefore, investigating the relationship between TMAO and the risk of cardiovascular and kidney disease in patients with PA is crucial.

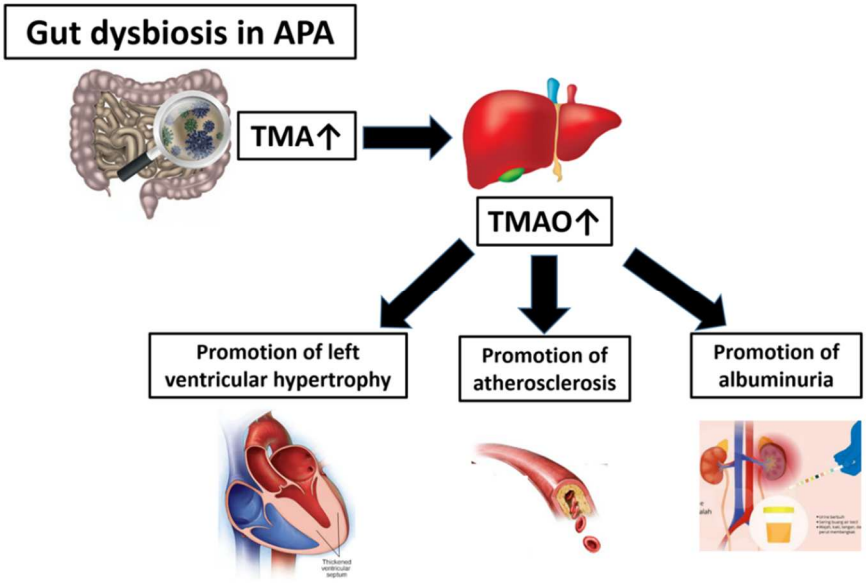
Methods: We enrolled 122 patients with aldosterone-producing adenoma (APA), including 98 patients who underwent adrenalectomy, and 98 patients with essential HTN from the TAIPAI Study Group database. The study examined differences in the gut microbiome and plasma TMAO levels between APA patients and essential HTN patients, as well as between APA patients before and 12 months after adrenalectomy. We also evaluated the relationship between plasma TMAO levels and cardiovascular and kidney risk using pulse wave velocity (PWV), left ventricular mass index (LVMI), and urine albumin-to-creatinine ratio (UACR).

Results: Patients with APA had relatively higher plasma TMAO levels than patients with essential HTN (808 ± 1540 vs. 466 ± 614 ppb, $p = 0.06$). Furthermore, at baseline, APA patients had higher PWV values (1,754 ± 379 vs. 1,647 ± 361 cm/s, $p = 0.02$) and an increased risk of left ventricular hypertrophy (42.2% vs. 23.9%, $p = 0.08$) and albuminuria (28.9% vs. 14.3%, $p = 0.01$) compared to essential HTN patients. Plasma TMAO levels decreased after adrenalectomy in APA patients (808 ± 1540 vs. 606 ± 622 ppb, $p = 0.08$). Our results also revealed differences in gut microbiota composition, including richness, diversity, and specific bacterial ratios, between APA and essential HTN patients.

In APA patients before adrenalectomy, higher plasma TMAO levels were associated with higher PWV ($\beta = 0.06$; $P = 0.008$) and higher UACR ($\beta = 0.001$; $P < 0.01$) in a multivariate linear regression analysis. Additionally, LVMI correlated with higher plasma TMAO levels ($\beta = 0.02$; $P = 0.013$) in the female subgroup of APA patients in a multivariate linear regression analysis.

Conclusion: Our study characterizes APA as having gut-dysbiosis–driven elevation of plasma TMAO, greater arterial stiffness, left ventricular hypertrophy, and albuminuria compared with essential HTN. Adrenalectomy lowers TMAO and partially reverses these complications. Elevated TMAO independently predicts arterial stiffness, albuminuria, and cardiac hypertrophy in females with APA, highlighting TMAO as a potential biomarker and therapeutic target for cardiovascular and kidney protection in APA.

Keywords：primary aldosteronism; aldosterone-producing adenoma; gut microbiota; Trimethylamine N-oxide (TMAO); hypertension; cardiovascular disease; albuminuria


Gut dysbiosis in APA
TMA↑
TMAO↑
Promotion of left ventricular hypertrophy
Promotion of atherosclerosis
Promotion of albuminuria

Poster Presentation：Electrolyte, Acid-Base, and Hypertension
Poster No.：C0427
Abstract Submission No.：APCN20250938

Urinary Potassium Excretion Rate in Patients with Chronic Hypokalemia: Spot vs 24-Hour Urine

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Abstract

Background: The collection of 24-hour urine for daily potassium (K+) excretion is still the traditional approach for hypokalemia. Although timely spot urine for electrolytes excretion rate is a fast and informative alternative, the diagnostic value of spot versus 24-hour urine K+ excretion for hypokalemic patients with K+ deficit has not well evaluated.

Methods: We consecutively examined the patients with chronic hypokalemia who completed the collection of both spot and 24-hour urine for electrolytes excretion rate over 5 years. Patients with acute hypokalemia were excluded. All received blood samplings before and after potassium (K+) supplementation to correct hypokalemia and the complete 24-hour urine collection. Their clinical and laboratory characteristics were analyzed. Spot urine K+ excretion was calculated by transtubular K+ concentration gradient (TTKG) and K+-creatinine ratio (K+/Cr).

Results: There were 258 hypokalemic patients (male to female 121:137, age 54.5 ± 19.4 years old) with serum K+ of 2.6 ± 0.5 mmol/L. Their causes of hypokalemia included renal tubular disorders (RTD, n=40), mineralocorticoid excess state (MES, n=51), chronic alcoholism (n=19), upper gastrointestinal (GI) disorders (n=41), lower GI disorders (n=25), use of diuretics (n=76), and others (n=6). Their average spot urine TTKG and K+/Cr were 7.0 ± 4.4 and 0.45 ± 0.46, respectively, whereas the 24-hour urine K+ excretion was 41.6 ± 30.0 mmol/day. For patients with RTD and MES, most of them (about 90%) had consistently higher K+ excretion in both spot and 24-hour urine (>20 mmol/day). When comparing spot urine (K+/Cr) and 24-hour urine K+ excretion, patients with GI disorders and those using diuretics showed different patterns: 29% and 9% had matched low K+ excretion, 42% and 74% had matched high K+ excretion, and 29% and 17% had unmatched K+ excretion, respectively. Spot rather 24-hour urine Na+ and Cl- excretion, and its ratio discriminated the causes of GI disorders and diuretic use.

Conclusions: Timely spot urine rather than 24-hour urine for electrolyte excretions better represents the pathophysiological state to help separate the causes of hypokalemia.

Keywords：hypokalemia, potassium excretion rate, urine biochemistry

Poster Presentation：Electrolyte, Acid-Base, and Hypertension
Poster No.：C0428
Abstract Submission No.：APCN20250950

Thiazide-Related Hypercalcemia And Acute Kidney Injury In A Patient With Primary Hyperparathyroidism

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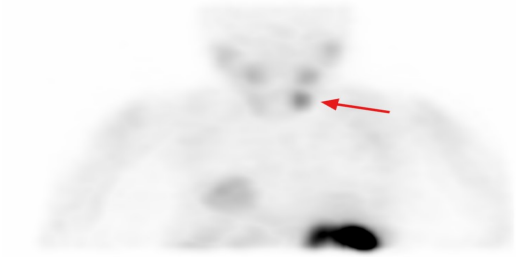
Abstract
This 85-year-old female with history of Type 2 diabetes, hypertension developed general weakness, moderate hypercalcemia, and acute kidney injury after taking thiazide for one week.
Serum calcium level and kidney functions were recovered after thiazide discontinued. However, there were elevated intact parathyroid hormone (iPTH) level, hypercalciuria, and hypophosphatemia. Technetium-99m sestamibi (Tc-99m MIBI) parathyroid scan revealed persistent, intensely increased tracer uptake behind lower pole of right thyroid region, suggesting primary hyperparathyroidism. Kidney sonography revealed a small left renal stone without hydronephrosis. In addition to avoid thiazide medication, the patient started to take calcimimetic treatment. This case highlighted the possibility of concomitant primary hyperparathyroidism hidden in patient with thiazide-related hypercalcemia and acute kidney injury.

Keywords：hypercalcemia, acute kidney injury, primary hyperparathyroidism, thiazide



Poster Presentation：Electrolyte, Acid-Base, and Hypertension
Poster No.：C0429
Abstract Submission No.：APCN20251053

Acquired Distal Renal Tubular Acidosis with Rare Mid-Body Anti-Nuclear Antibody Pattern, Osteomalacia, Short Stature and Pubertal Arrest

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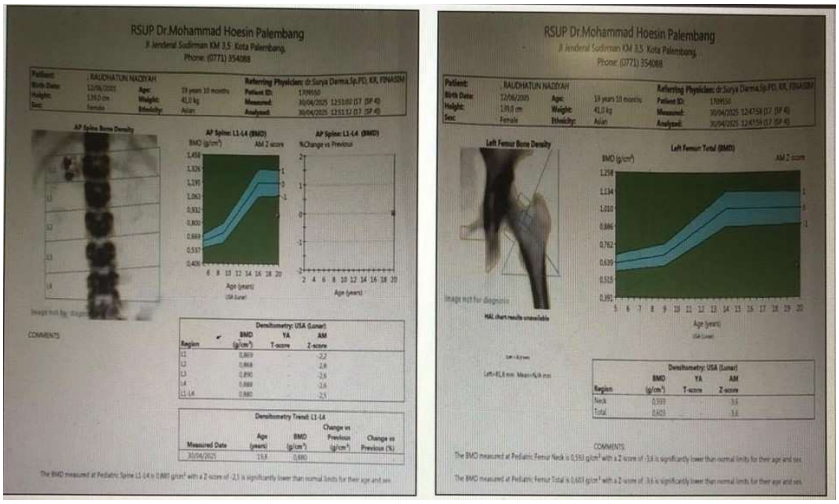
Abstract

Distal Renal Tubular Acidosis (dRTA) is a pathology that arises from a variety of distal tubular acid transport abnormalities in the kidneys. The presentation of dRTA is often with kidney stones, rickets/osteomalacia and growth retardation in childhood with a final appearance of short stature as an adult. This case report presented a young woman with periodic paralysis hypokalemia, nonuremic-hyperchloremic-Non Anion Gap Metabolic Acidosis (NAGMA), the degree of urine acidity (pH) always above 6, decreased renal function, no findings of kidney stones, also osteoporotic bone feature from Bone Mass Densitometry (BMD) with hypocalcemia, vitamin D deficiency and secondary hyperparathyroidism, as the signs of Osteomalacia. Her condition is considered acquired form of dRTA with rare mid-body Anti-Nuclear Antibody Pattern. Inadequately diagnosed and treated dRTA in her childhood had progressed to Chronic Kidney Disease (CKD) and contributed to serious bone complication, which also in turn affected her pubertal process, namely Functional Hypogonadotropic Hypogonadism. The patient's short stature, initially thought to be due to impaired bone mineralization in dRTA and/or CKD, was found to be unrelated, instead a condition of Familial Short Stature. The management of this patient focused on several purposes, namely; preventing and treating symptoms, slowing the progression from CKD to End Stage Renal Disease that dependent on Renal Replacement Therapy, preventing complications of further bone destruction that will eventually affect patient's stature, and improving pubertal arrest. In the end, the goal of treatment is improving patient's quality of life.

Keywords：Acquired dRTA, CKD, Osteomalacia, Short Stature, Pubertal Arrest



Poster Presentation：Electrolyte, Acid-Base, and Hypertension
Poster No.：C0430
Abstract Submission No.：APCN20251125

Case Report of Genetically Caused Severe Hypokalemia (Gitelman Syndrome)

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Abstract
Background:
Gitelman syndrome is a manifestation of a mutation in the SLC12A3 gene that encodes the thiazide-sensitive sodium chloride cotransporter (NCC) present in the apical membrane of cells on the distal convoluted tubule. More than 350 mutations in SLC12A3 have been identified in these patients. Gitelman syndrome is an autosomal recessive tubular disorder.
Gitelman syndrome is a rare disorder. It is characterized by renal potassium wasting, hypokalemia, metabolic alkalosis, hypocalciuria, hypomagnesemia, and hyperreninemic hyperaldosteronism.

Case presentation:
Patient's information: Age: 31, Sex: Female
Body weight: 34kg, Height: 145cm
BMI: 16.6kg/m2, Occaption:Chef
Pregnancy: 1, Delivery: C-section
Family: 4, Lives with her parents and her son
/She is fifth child of her family, she has 4 brothers and a younger brother/

Chief complaint: Low blood pressure, Cramps, muscle weakness, Unable to walk by herself, Carpopedal spasm, Excessive thirst, Increased urination, Severe fatigue

Past Medical History:
Since childhood: there were occasional weakness in the arms and legs. These symptoms improved spontaneously within 2-3 days, so she never sought medical attention. She lost 9kg within a month Nov to Dec/2022. A month ago, her legs and arms started to get weak. She hospitalized in her soum and provincial hospital, but she did not improve, On 19/Dec/2022 she came at ED of our hospital with symptoms as muscle weakness, and unable to walk.

Physical examination: Blood pressure: 70/40mmHg/right side/, 60/40mmHg/left side/
Physical examination of all organ systems were normal
Joint structure and function were normal
Arms and legs muscle strength: 2-3 scale.
Urine Output: 2500ml/day

Laboratory analysis
CBC: Leukocytosis, Thrombocytosis /WBC 11.1 10^9/L , PLT 609 10^9/mL/
Biochemistry: Severe Hypokalemia K 1.79mmol/l, Hypomagnesemia Mg 0.6mmol/l, Hypochloremia Cl 92.6mmol/l, Hyponatremia Na 134mmol/l, Crea 64umol/l, Ca 2.4mmol/l
Arterial Blood Gas: Metabolic alkalosis pH7.482↑, cHCO3 25.3↑
Urine analysis- pH 7.5
24hour urine electrolytes analysis:
K 18.8mmol/l, Ca 0.3mmol/l, Cl 92.2mmol/l, Crea 1.4mmol/l
FE K+ 27%, TTKG 16, FE Ca+ 0.003, FE Cl- 2.4%

Urine K/Cr= 18.8meq/l/0.25g/l= 75meq/g confirming renal potassium wasting.
Urine Ca/Crea(mg/mg) = 1.2mg/dL/ 25.2mg/dL= 0.047 hypocalciuria

Probably Gitelman syndrome

Medical test:
ECG:T wave flattening, ST-segment depression, Prominent U waves , Long QT intervals in all leads.
Abdominal US: Renal size normal, 1.0-2.0cm multiple cysts in the both kidney
Karyotype Test: A normal female karyotype (46XX)
Genetic Test: SLC12A3 gene pathogenic mutation - positive

Diagnosis: Gitelman Syndrome

Treatment: Gitelman syndrome KDIGO-2017 guideline Potassium and Magnesium replacement therapy.

Conclusions: Gitelman syndrome should be considered in patients with hypokalemia complicated with hypomagnesemia and hypocalciuria. Genetic testing is essential to confirm the diagnosis.

Keywords：SLC12A3 gene, Gitelman syndrome, Hypokalemia, Hypomagnesemia, Hypocalciuria

Poster Presentation：Electrolyte, Acid-Base, and Hypertension
Poster No.：C0432
Abstract Submission No.：APCN20251133

Projected Burden of Chronic Kidney Disease Due to Hypertension in Indonesia, Vietnam, and the Philippines for 2030 and 2050: Which Country Will Have the Highest Burden?

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Abstract
Hypertension is one of the factors that can accelerate the progression of chronic kidney disease to kidney failure. In Southeast Asia, including Indonesia, Vietnam, and the Philippines, the prevalence of chronic kidney disease due to hypertension continues to rise. This study aims to project the burden of chronic kidney disease due to hypertension in Indonesia, Vietnam, and the Philippines through 2030 and 2050 using the DALYs (Disability-Adjusted Life Years) metric.
This study utilizes R software to analyze and project the progression of chronic kidney disease due to hypertension in Indonesia, Vietnam, and the Philippines through 2030 and 2050. The data used were obtained from the Global Burden of Disease (GBD) with a DALYs (Disability-Adjusted Life Years) metric covering the period from 2010 to 2021 for the age group of 55 years and above. Linear regression was used to project the disease burden in 2030 and 2050.
Based on the results of linear regression analysis, the projected burden of chronic kidney disease due to hypertension in the age group 55 years and above in Indonesia, Vietnam, and the Philippines shows a significant increase. In Indonesia, the projected number increases from 2021 with 393,328 cases to 512,020 cases in 2030 and 789,329 cases in 2050. Vietnam is projected to experience an increase from 187,957 cases in 2021 to 247,846 cases in 2030 and 380,202 cases in 2050. Meanwhile, the Philippines is projected to experience an increase from 243,692 cases in 2021 to 313,723 cases in 2030 and 467,992 cases in 2050. This projection indicates that chronic kidney disease due to hypertension will keep increasing in these three countries, with Indonesia having the highest growth.
Indonesia is predicted to experience the highest disease burden, with 512,020 cases in 2030 and 789,329 cases in 2050, followed by the Philippines and Vietnam. Projections of the burden of chronic kidney disease due to hypertension in Indonesia, Vietnam, and the Philippines show a significant increasing trend until 2030 and 2050. This increase reflects the urgent need to strengthen preventive health policies and chronic kidney disease management in the three countries

Keywords：Chronic Kidney Disease, Projected Burden, Hypertension

Poster Presentation：Electrolyte, Acid-Base, and Hypertension
Poster No.：C0433
Abstract Submission No.：APCN20251212

Incidence and Associated Risk Factors of Electrolyte Imbalances and Acute Kidney Injury Among Patients Treated with Polymyxin B: A Retrospective Cohort Study

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Abstract

Introduction

Polymyxin B (PMB) is an antibiotic used to treat infections caused by gram-negative bacteria. It has known adverse effects, including nephrotoxicity, specifically the development of acute kidney injury (AKI). Some studies also reported the occurrence of hypokalemia, hypomagnesemia, and hyponatremia with its use. This study aimed to determine the incidence and factors associated with the development of AKI and electrolyte imbalances among patients treated with Polymyxin B.

Methods

We conducted a retrospective cohort study using medical records of admitted patients from January to December 2022 with an infection given with PMB. The occurrence of nephrotoxicity, defined as the occurrence of either AKI or electrolyte imbalances (hypokalemia, hypomagnesemia, hyponatremia, hypocalcemia), was calculated as an incidence rate. Associated risk factors were determined using Cox proportional hazard.

Results

Of the 202 patients included in the study, 192 (95.1%) developed nephrotoxicity, with 173 (85.6%) developed electrolyte imbalance. The most frequent electrolyte imbalance was hypomagnesemia (81.2%), followed by hypokalemia (68.3%). In the multivariate analysis of significant risk factors, dosing (HR 1.00 [95% CI 1.00-1.00], p = 0.555) and duration of polymyxin B use were not associated with increased risk of nephrotoxicity. There was also no identified level of kidney function, comorbidity, and concomitant use of nephrotoxic agents, which led to increased nephrotoxicity (HR 1.10 [95% CI 0.82-1.47], p = 0.531). The lowest level of electrolytes recorded were as follows: hypokalemia 2.70 mmol/L (SD 0.44), hypomagnesemia 0.47 mmol/L (SD 0.12), hypocalcemia 1.98 mmol/L (SD 0.14), hyponatremia 127 mmol/L (SD 4.84).

Conclusion

This study shows the high incidence of AKI and electrolyte imbalances among patients treated with Polymyxin B, with the most frequent electrolyte abnormality being hypomagnesemia and hypokalemia. While the cumulative dose and duration of polymyxin, and the presence of multiple sites of infection and use of vancomycin had a statistically significant increased incidence of nephrotoxicity, none of the factors analyzed were shown to be independent risk factors for the occurrence of nephrotoxicity.

Keywords：Polymyxin B, Acute Kidney Injury, Electrolytes, Nephrotoxicity