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INTEREST OF RENAL DOPPLER IN THE EVALUATION OF RENAL FUNCTION IN INTENSIVE CARE IN A PATIENT IN SEPTIC SHOCK ABOUT A CASE

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ABSTRACT

Doppler renal evaluation, specifically using the renal resistive index (RRI), offers a non-invasive method to assess renal function in septic shock, potentially predicting acute kidney injury (AKI) and guiding hemodynamic management. It helps detect early changes in renal blood flow, providing valuable information beyond traditional measures like serum creatinine.

KEYWORDS

Renal doppler , Septic shock

MAIN ARTICLE

Observation

It is Mrs. Z.B, 30 years old, admitted to intensive care for the management of a state of septic shock, on acid-ketone decompensation, on a serious infectious pneumonia.

With a history of diabetes for 10 years on oral antidiabetics, smoking and chronic alcoholism for 5 years.

The examination on admission found a restless patient, tachypneic at 30 cycles per minute, tachycardium at 130 beats per minute, ketone breath, capillary blood glucose at 4g30 with positive ketonuria at 3 crosses.

Patient benefiting from rehydration with supplementation, correction of glycemic figures by insulin therapy with an electric syringe push.

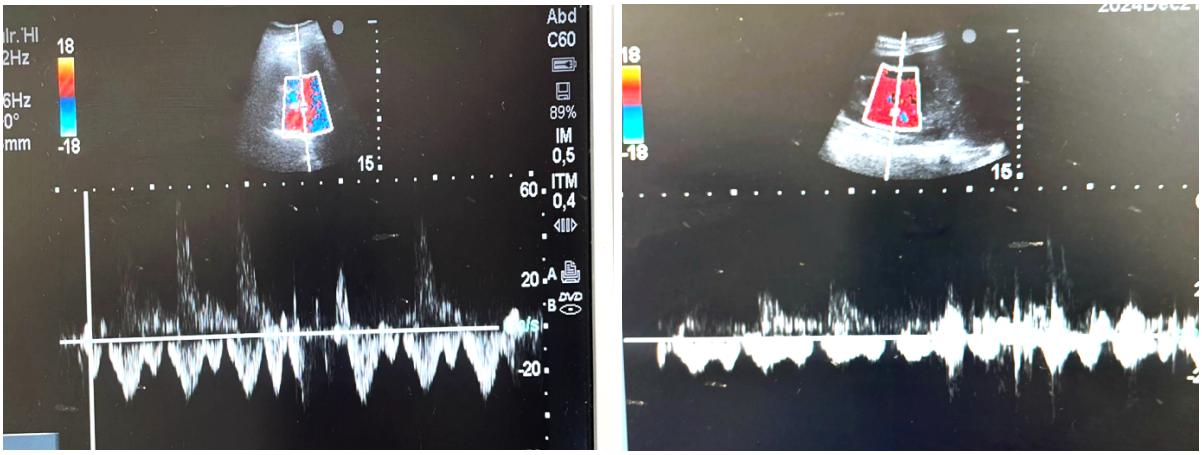
Chest imaging objectifying a bilateral interstitial alveolar focus and aggravation of the gas exchange, motivating the intubation of the patient.

The result was a worsening of renal function with the onset of acute renal failure with a urea of 1.5 and a creat of 65, an estimated clearance of 15, oligoanuria and pulmonary overload due to excessive filling for the correction of ketoacidosis.

A pleuropulmonary ultrasound showing an accentuation of the B lines at the pulmonary bases.

Renal ultrasound did not objectify any obstacle, collection or pyelocalicial dilatation, however images of severe renal congestion were demonstrated.

Ultrasound follow-up at the patient's bedside with a restrictive strategy limited to 500 cc of solutes per day and the placement of diuretics, has shown its effectiveness on renal congestion, with resumption of retained diuresis, and improvement of clearance and renal function without recourse to extrarenal purification.



Images showing an assessment of renal venous congestion before and after depletion.

Discussion

Despite advances in diagnosis and management, septic shock mortality remains as high as 30%–40%.1 Septic shock is responsible for millions of deaths per year worldwide.2 Early intravenous fluid (IVF) resuscitation, a cornerstone of septic shock management, can restore intravascular volume and augment cardiac output to improve end-organ perfusion. However, endothelial dysfunction, a defining characteristic of sepsis, causes fluid extravasation into the tissue. Mounting evidence suggests that such overzealous fluid administration results in interstitial oedema and iatrogenic organ injury.3 The narrow therapeutic window for IVF administration in septic shock creates an urgent need to identify better physiological markers that can tailor haemodynamic resuscitation to individual patient physiology. Venous congestion is a promising physiological marker that may be able to help direct the resuscitation of patients with septic shock. In venous congestion, pathogenic retrograde pressure from the right atrium impairs venous drainage from organs (eg, kidneys) resulting in organ oedema and dysfunction.4–5 Venous congestion is an important haemodynamicstate for critically ill patients because it is associated with impaired organ function, particularly AKI.5–7 While several processes, such as new or chronic cardiomyopathy, can predispose patients to venous congestion, excessive IVF administration is hypothesised to be an important iatrogenic cause. Venous congestion of multiple organs can be readily measured in real-time at the bedside using Doppler ultrasonography. Venous congestion, determined by abnormal measurements or flows in the inferior vena cava (IVC), hepatic vein (HV), portal vein (PV) and intrarenal veins (IRV), has been associated with worsening AKI in patients post cardiac surgery, those with cardiorenal syndrome, and in a general medical-surgical intensive care unit (ICU) cohort.4–6 What needs to be discovered is whether venous congestion is associated with worsening renal function in patients with septic shock. In doing so, we seek to identify a promising physiological marker that can provide cues for the de-escalation of IVF administration and/or de-resuscitation.

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