



Clinical case

Hypoglycemia indicative of inappropriate renutrition syndrome. About a case observed in the intensive care unit of Jason Sendwe Hospital in Lubumbashi, DR Congo

Hypoglycémie révélant un syndrome de renutrition inappropriée. À propos d'un cas observé dans le service de réanimation de l'hôpital Jason Sendwe à Lubumbashi, RD Congo

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Résumé

Le syndrome de renutrition inappropriée (SRI) est une complication métabolique potentiellement mortelle à laquelle sont particulièrement exposés les patients en réanimation. L'absence d'une définition universellement adoptée et son polymorphisme clinique en font une pathologie sous diagnostiquée. Le cas clinique présenté est celui d'un patient d'une vingtaine d'années opéré pour une perforation intestinale et réopéré pour fistule entérale à haut débit quelques jours plus tard. 24 heures après réintroduction de l'alimentation, il a présenté des palpitations, une transpiration profuse, une tachycardie et une tachypnée. La glycémie dosée en urgence (20 mg/dl) n'a pas pu être remontée jusqu'à la survenue des convulsions tonico-cloniques généralisées suivies quelques minutes après d'un arrêt cardiorespiratoire. Les résultats biologiques délivrés post mortem se sont avérés perturbés et ont permis de poser le diagnostic du SRI. Pour la pratique quotidienne, ce cas clinique permet de reconnaître l'importance d'anticiper et de

prévenir le SRI, particulièrement dans les unités de réanimation.

Mots-clés : hypoglycémie, syndrome de renutrition, réanimation, Lubumbashi, étude des cas.

Abstract

Inappropriate renutrition syndrome (IRS) is a life-threatening metabolic complication to which patients in intensive care are particularly exposed. The lack of a universally adopted definition and its clinical polymorphism make it an underdiagnosed pathology. The clinical case presented is that of a patient in his twenties who was operated on for an intestinal perforation and reoperated for a high-flow enteral fistula a few days later. 24 hours after reintroduction of the diet, he presented with palpitations, profuse sweating, tachycardia and tachypnea. The blood glucose measured in emergency (20 mg/dl) could not be raised until the onset of generalized tonic-clonic convulsions followed a few minutes later by cardiorespiratory arrest. The post-mortem laboratory

results were found to be disturbed and allowed the diagnosis of IRS. For daily practice, this clinical case recognizes the importance of anticipating and preventing IRS, particularly in intensive care units.

Keywords: hypoglycemia, renutrition syndrome, resuscitation, Lubumbashi, case study.

Introduction

Inappropriate renutrition syndrome (IRS) is the set of clinical signs and biological disturbances observed at the beginning or during refeeding after prolonged fasting or in a context of undernutrition (1). It is a rare but potentially fatal complication whose prevalence and incidence, although underestimated and variable according to the definition criteria, remain high and worrying (2–5). A recent study from 2024 mentions a mortality of around 36.5% in malnourished patients (6). SRI, given its atypical clinic and the absence of a universally accepted definition, remains unknown to a majority of medical staff (7). According to a survey carried out in the United Kingdom, a large majority of medical staff are unable to correctly diagnose it and identify risk factors (8). In low-income countries, most patients are at risk of developing SRI. However, no study on the subject has been published. We present a case of SRI revealed by hypoglycemia in an intensive care patient.

Clinical case

This is the case of a patient in his twenties, with no history, admitted for peritonitis by intestinal perforation. He states that he had been fasting for about 6 days before the laparotomy, which consisted of an intestinal suture in the bursa. He was then transferred to intensive care for further treatment. The examination of admission reveals a weight loss (previous weight: 68 kg, current weight estimated at 50 Kg, i.e. a weight loss of 26.47%; height: 166 cm,

i.e. BMI: 18.14 kg/m²). His physical examination was unpretentious. He received the following treatment:

- Antibiotic therapy: 4.5 g piperacillin + tazobactam every 12 hours and 500 mg metronidazole every 8 hours;
- Analgesics: 1g of paracetamol every 8 hours and 100 mg of tramadol every 12 hours;
- Hydration: 1L of RL, NaCl 0.9% and GF 5% alternating every 8 hours;
- PPI: 40 mg omeprazole every 12 hours;
- Antioxidant: 500 mg of vitamin C every 8 hours.

On day 5 post-laparotomy, a high-flow enteral fistula was diagnosed. We noted a marked alteration in his general condition (weight loss: weight estimated at 40kg, i.e. a BMI of 14.5 kg/m²; weight loss: 41.2%). The next day, on day 6 post-laparotomy, a reoperation consisting of a stoma was performed. Initial medical treatment was continued, and oral feeding was allowed immediately after awakening. Eating therefore began 12 hours later (hot sweet tea every morning and evening) and the evolution seemed favourable. Paradoxically, 24 hours after resuming feeding, the patient suddenly experienced profuse sweating, palpitations and asthenia, in addition to being tachycardic and tachypneic. The rest of the physical examination was normal. An emergency sample was taken: the haemoglobin was normal, but the blood sugar was 20 mg/dl, the other assessments being carried out. Then, resuscitation was initiated, made of a bolus of 50ml of 50% SG, relayed by 10% SG, without clinical improvement. The blood glucose was remeasured 20 minutes later: 19 mg/dl. Another bolus of 50% OS and 200 mg hydrocortisone were injected. A few minutes later, generalized tonic-clonic convulsions set in, lasting about 90 seconds, during which the patient was placed in PLS and a Guedel cannula protected the tongue. These convulsions stopped spontaneously. A few minutes later, a cardiopulmonary arrest occurred. CPR was initiated

but was unsuccessful and death was announced. The ion balance made available the next day showed some disturbances, grouped in the table below:

Table 1: Biological Results

Ions	Results (Reference values)
Potassium	3.15 mmol/L (3.50-5.30)
Sodium	145.1 mmol/L (135-145)
Chlorine	107.6 mmol/L (96-110)
Total Calcium	9.0 mg/dL (8.5-10.2)
Magnesium	1.65 mg/dL (1.7-3.0)
Phosphorus	2.0 mg/dL (2.5-5.0)

Discussion

The polymorphous clinic and the unpredictable evolution of inappropriate renutrition syndrome (IRS) mean that it needs to be anticipated, and the identification of risk factors is an essential step. In order to classify patients according to their risk, the recommendations of the National Institute of Health and Clinical Excellence (NICE) and those of the American Society of Parenteral and Enteral Nutrition (ASPEN) are available. They take into account, with a few differences, body mass index (BMI), weight loss, duration of fasting, ionogram, history of alcohol abuse or medication. After reoperation, the patient presented here met three major criteria (BMI of 14.5 kg/m², weight loss of 41.2%, fasting of about 12 days), which places him at major risk of presenting complications related to SRI. More recent studies have confirmed these criteria: one, published in 2024, identified fasting longer than 5 days as a factor associated with SRI (4); another prospective cohort study identifies fasting of more than 10 days and weight loss of more than 15% as predictors of SRI (7). Identifying risk factors for SRI would therefore improve patient outcomes (2).

This patient did not receive an initial nutritional assessment. However, according to recent publications, between 37.8 and 78.1% of patients admitted to the intensive care unit (ICU) are malnourished (3); and

malnourished patients are likely to develop SRI (7). Thus, malnutrition screening should be systematically carried out in patients admitted to intensive care (9,10).

The patient's clinic made it possible to evoke a plethora of differential diagnoses. The biological signs found in him are hypoglycemia, hypokalemia and hypomagnesemia. So far, there is no universally accepted definition of SRI (7). In 2020, ASPEN defined it as a decrease in one or more electrolytes which are: phosphate, potassium or magnesium (7). Other studies have attempted to define it as a 30% decrease in phosphate from normal baseline values or a decrease in two of the three electrolytes (phosphate, potassium, magnesium) during the 72 hours following a refeeding, in the absence of other possible causes (7,11). Indeed, ionic alterations, without however defining it, are frequently encountered in the SRI. For example, pre-feeding phosphorus levels predict severe SRI, according to a retrospective cohort study that included 3854 adults (9). Another cohort study in Thailand found that baseline hypokalemia was associated with SRI in adults (4). However, it remains difficult to obtain a standardised definition, as none of them showed a link with deaths or length of hospital stay (12).

Dosing ions before refeeding and during patient follow-up makes it possible to anticipate SRI. And in the event of any disturbance, a protocol for correcting the ionic imbalance is essential before any initiation of the diet. This was life-saving for a 72-year-old patient who had a phosphorus test performed on time and a replacement successfully implemented, advocating for vigilant electrolyte monitoring in patients admitted to the ICU (13).

In addition to identifying risk factors, one of the keys to reducing the risk of developing SRI is a low initial caloric intake that is appropriate for each patient (5,7). This would be associated with better overall survival, decrease length of stay and reduce the incidence of serious infections in hospitalized patients (7).

However, in resource-limited countries, financial limitations make it almost impossible to implement

these protocols. It would therefore be necessary for local protocols adapted to these circumstances to be put in place.

Conclusion

This article reports the case of an inappropriate renutrition syndrome (IRS) revealed by hypoglycemia. It is a rare entity and above all unknown in our circles. The patient presented, after initiation of refeeding, went into cardiorespiratory arrest after a tonic-clonic seizure following severe hypoglycemia. The results of the ionogram made it possible to make the post-mortem diagnosis of SRI. Despite the lack of a universal definition, the outcome of this case leads back to the updated recommendations that every effort should be made to prevent the occurrence of IRS in routine practice. The protocols available unanimously support the importance of: (1) Screening for SRI by looking for its risk factors, assessing the nutritional status of patients and performing an initial ionic assay (phosphate, potassium and magnesium); (2) Anticipate SRI by ensuring a possible correction of ionic disorders before any refeeding, by adopting the strategy of low and relatively increasing caloric intake and by ensuring continuous clinical and biological monitoring.

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Available online : February 28, 2025

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Conflict interest : None

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To cite this article :

P Masele Kyaite, N Mambue Mwepu, K-R Itেকে Fefe. Hypoglycemia indicative of inappropriate renutrition syndrome. Hypoglycemia indicative of inappropriate renutrition syndrome. About a case observed in the intensive care unit of Jason Sendwe Hospital in Lubumbashi, DR Congo. *Jaccr Africa 2025; 9(1): 157-161*

<https://doi.org/10.70065/2591.jaccrAfri.009L012802>