LACTIC ACIDOSIS FROM METFORMIN IN EMERGENCY ROOM: CASE REPORT

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Abstract

Lactic acidosis is a metabolic alteration that can evolve in any reduced tissue hypoxic state in case of hepatic dysfunction, pulmonary embolism, and acute myocardial infarction. Signs and symptoms of acidosis not always are easily noticeable. In fact acidosis can be asymptomatic or can be accompanied by vague asthenia, nausea or vomiting. A distinctive symptom of acidosis is hyperpnoea, an increased depth followed by an increased frequency of breathing. Severe acidosis can determine cardio circulatory shock due to a reduced myocardial contractility or progressive sensory alteration.
Abstract

L’acidosi lattica è un’alterazione metabolica che può svilupparsi in qualsiasi stato di ridotta ossigenazione tissutale, in caso di disfunzione epatica, embolia polmonare, infarto acuto del miocardio. I segni e i sintomi dell’acidosi non sempre sono facilmente distinguibili, questa può infatti essere asintomatica o può essere accompagnata da vaga astenia, nausea o vomito. Il sintomo caratteristico dell’acidosi è l’iperpnea cioè inizialmente un aumento della profondità e poi un aumento della frequenza degli atti respiratori. L’acidosi grave può determinare shock cardiocircolatorio dovuto a ridotta contrattilità miocardica o progressiva alterazione sensoriale.

Case Report

Introduction

F.B., a forty-eight-years-old woman, arrives at Emergency Room for chest and abdominal pain linked to a vomiting that it’s been going on same days.

In the remote pathological anamnesis the patient appears affected by type 2 diabetes mellitus in treatment with metformin 1000 mg at meals. Besides she presents high blood pressure in treatment with lisinopril 20 mg associated with idroclortiazide 12,5 mg, amiodipine 5 mg, daxozina 4 mg. The patient hyperventilates, at the chest she presents physiological murmurs, the heart rate is 75 bpm and the blood pressure is 120/50 mmHg. The abdomen is globose due to adipis but it is treatable, it is not painful at superficial and deep palpation.

An ECG is performed and it shows a normal sinus rhythm. ST-T tract doesn’t show alterations. Hematochemical examinations are performed and reveal: 4.650.000 mc/L red blood cells; 11,9 g/dl haemoglobin; 72,8 middle globular volume; 11.020 mc/l white blood cells; 331.000 mc/L platelets. Patient is submitted to a renal echography that shows regular sized kidneys, with a dense parenchymal thickness, weakly hypoechoic., without dilation of the kidney drainage system A therapy with furosemide in high doses (250 mg e.v.) is undertaken, hydration, 15 phials of sodium bicarbonate are performed and it is given a magnesium hydroxide for high phosphorus. Patient becomes oliguric.

Hematochemical examinations, that don’t show any sign of improvement, and a new continuing hemogasnalysis are repeated and show lactic acidosis with an increase of lactates (14,7 mmol/L), pH 7,18. Since the patient is oliguric, a central venous catheter is inserted and she is invited to undergo a dialysis session. During the dialysis the patient shows a worsening of the hemodynamic condition but she is retrieved and undergoes an only one-hour dialysis session. She is submitted to other five dialytic sessions during the confinement associating hydration and furosemide and glicemia treatment is started with low doses of rapid insulin. Creatinine values now are 3 mg/l, it is decided to continue only with hydration and diuretic. At the discharge the patient presents 1 mg/dl creatinine.

Discussion and Conclusions

This clinical case shows a rare but extremely serious metabolic complication of metformin: lactic acidosis. Drugs containing metformin show a Boxed Warning regarding this serious adverse reaction (1, 2). Lactic acidosis threatening life can occur due to accumulation of metformin. The principle factor of risk is renal alteration; other factors of risk include the well on in years associated with a reduced renal function, and high dosages of the medicine (greater than 2g/die). Metformin is contraindicated in acute conditions associated with a potential compromise of renal function, like dehydration (3, 4, 5).

Since 1985, the Therapeutic Goods Administration has received 141 signals of lactic acidosis associated with Metformin, 25 of them with a fatal result. Lots of signals described a recent story of diarrhea, vomiting or gastrointestinal infection before the acidosis development.
In literature there are cases of individuals with lactic acidosis treated with metformin, diuretics, ace-inhibitors that presented at first nausea, vomiting and diarrhea. In one case the individual died in shock; in another case the emergency dialysis had been decisive (6).

If patients who take metformin have vomiting and/or diarrhea, in concomitance with a scarce food introduction, it should be taken into consideration the possibility to temporarily suspend metformin until the return to a normal nutrition. Besides, diuretic treatment should be suspended. Lactic acidosis treatment should consider the triggering causes, adequate oxygenation and vascular perfusion of tissues, rehydration and infusion of sodium bicarbonate (only in case of severe acidity with a ph less than 7) to elevate ph over 7.2, together with insulin and glucose. When sodium is badly tolerated, hemodyalisis can be considered a useful alternative (7, 8).

The mortality of this condition is higher than 50 per cent.

References

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