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## Public–private collaboration in the gestion of hemodialysis vascular access

### Colaboración público-privada en la gestión del acceso vascular para hemodiálisis



Dear Editor,

The native arteriovenous fistula (nAVF) is the vascular access (VA) of choice for haemodialysis (HD) as opposed to central venous catheters (CVC).<sup>1,2</sup> Outcomes can be influenced by organisational and resource management factors.<sup>3,4</sup> The high use of CVC in units is a long-standing problem,<sup>5,6</sup> worsened by the COVID-19 pandemic,<sup>7</sup> during which elective surgeries, including VA,<sup>8</sup> were postponed and the public health service failed to resolve the problems of delayed interventions in all specialist areas.<sup>9</sup> The high proportion of CVC makes it necessary to devise strategies to reverse this situation. From July 2021 at the Lalín centre, attached to Hospital de Santiago, an agreement was established that stipulated that the centre was responsible for the creation of VA which did not require hospital admission for patients in its area, including patients with advanced chronic kidney disease (ACKD). The hospital took care of VA requiring hospital admission (prosthesis or basilic superficialisation)<sup>4,5</sup>; of patients who were dialysed at the centre from October 2020 to February 2022; 24 (53.3%) had CVC. Ten patients were assessed for nAVF at the external centre. Four patients were referred to the referral hospital; two because they required inpatient techniques and two refused the referral to the outpatient centre. Six autologous nAVF were performed at the external centre (two radiocephalic and four elbow nAVF), all of which were functional. The average time from mapping at the outpatient centre was 10.5 days and from mapping to surgery 11 days; at the hospital it was 73 days. The percentage of catheters decreased and the percentage of fistulae increased significantly in prevalent patients at the centre (Table 1). VA surgery does not require hospitalisation or general anaesthetic,<sup>10</sup> so it can be performed at outpatient surgery centres outside hospital circuits, speeding up the intervention and not interfering with (or being interfered with by) more urgent or complex disorders. The strategy of combining resources and managing public and private capacities jointly from the referral hospital offers a valid and effective alterna-

**Table 1 – Percentage of prevalent patients with CVC or nAVF/prosthesis at the end of the two study periods.**

	Period 1: 1/October/2020 to 30/June/2021, before the start of the public–private partnership	Period 2: 1/July/2021 to 28/February/2022, after the start of the public–private partnership	p
Central venous catheter	26 (55.6%)	12 (26.7%)	<0.001
Native fistulae/prosthesis	20 (44.4%)	34 (73.3%)	

nAVF: native arteriovenous fistula.

tive to improve outcomes within a very short time, with the greatest safety.

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## Cerebral salt-wasting syndrome associated with ingestion of chlorine dioxide used to prevent SARS-COV2 infection

### Síndrome pierde sal cerebral asociado a ingesta de dióxido de cloro utilizado para prevención de infección por SARS-COV2



Dear Editor,

The SARS-CoV-2 pandemic has been the most devastating worldwide health, social and economic crisis in recent years. In the midst of the pandemic products were being promoted for the prevention and treatment of this coronavirus. Some of these products included chlorine dioxide or sodium chlorite, also known as Miracle Mineral Solution (MMS).<sup>1</sup>

Chlorine dioxide is a potent oxidising agent which rapidly dissociates in biological tissues producing its active agent, sodium chlorite.<sup>2</sup>

There is currently no scientific evidence to accredit safety or efficacy in the use of this substance and its derivatives against SARS-CoV-2. Furthermore, since 2010, different health authorities, such as the Agencia Española de Medicamentos y Productos Sanitarios (AEMPS) [Spanish Agency for Medicines and Medical Devices], the Food and Drug Administration (FDA), the Pan American Health Organisation (PAHO) and the Therapeutic Good Administration (TGA), have warned of the severe side effects related to the consumption of sodium chlorite.<sup>3,4</sup>

We present here the first case to be described in the literature of cerebral salt-wasting syndrome manifesting with

severe hyponatraemia as an adverse reaction to chlorine dioxide consumption.

This was a 61-year-old male with no previous medical history, not vaccinated against SARS-CoV-2, who of his own free will began to consume chlorine dioxide daily in the belief that it would prevent the infection. After two weeks he developed gradual-onset encephalopathy symptoms with bradypsychia, derealisation, irritability and anxiety. Physical examination revealed dehydration of skin and mucosa. Brain computed tomography (CT) revealed cerebral oedema and idiopathic intracranial hypertension (Fig. 1). Fundus examination and lumbar puncture were normal. Blood tests showed: sodium 112 mEq/l; chlorine 77 mEq/l; plasma osmolarity 230 mOsm/kg; and uric acid 2.2 mg/dl; and fractional excretion of uric acid (FEUa) on admission was 15.4% and after 72 h with normalisation of natriuria, 11.4%. Venous blood gases: pH 7.42, bicarbonate (HCO<sub>3</sub>) 21 mmol/l, CO<sub>2</sub> 42 mmHg. No other findings of note. Urinalysis: sodium 72 mEq/l, potassium 30 mEq/l, chlorine 55 mEq/l, uric acid 15.4 mg/dl and osmolarity 224 mOsm/kg. The chlorine dioxide was immediately discontinued and treatment was started for water and electrolyte replacement progressively according to sodium deficit, with gradual restoration of neurological status and return to normal of analytical parameters (Table 1). A differential diagnosis of “other possible causes of hyponatraemia” was made.

Consumption of chlorine dioxide increased exponentially during the pandemic due to the spread of misinformation