The work described and coordinated among professionals has helped the two units to achieve accreditation. The introduction of ICPs is a useful tool for continuous improvement and for certification of CMUs that treat paediatric patients, becoming a guarantee of quality for the care of the public.

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Procalcitonin and early-onset seizures: When do we offer a higher diagnostic yield?☆,☆☆

Procalcitonina y síndrome febril precoz: ¿cuándo nos ofrece mayor rentabilidad diagnóstica?

Dear Editor:

Fever is one of the most frequent reasons for paediatric emergency visits. It may be caused by an invasive bacterial infection in up to 30%[1] of cases, and it is important that these patients are identified to initiate treatment early. To this end, we can use laboratory markers of infection such as peripheral white blood cell (WBC) counts, C-reactive protein (CRP) or procalcitonin (PCT), and several studies have concluded that the latter is probably most useful.[2] However, the data are scarce for the paediatric age group and there is no evidence on what the optimum time is for its determination.

The aim of our study was to analyse the time at which the diagnostic yield of PCT is highest, as well as the ideal cut-off point to differentiate a severe bacterial infection, and we also compared PCT with other markers of infection.

We conducted a prospective, observational, analytical cohort study at the paediatric emergency department over the course of 12 months. The study included 217 patients (ages 7 days–36 months) presenting with fever without a source of less than 48 h of duration on whom a blood test was performed to rule out bacterial infection due to clinical warning signs (general malaise, inadequate reduction of fever, etc.). We excluded children that had been given antibiotics. We collected data for age, duration of fever in hours (categorised by the most common time intervals used in emergency practice: <6, 6–12 and >12 h), WBC count, CRP and PCT levels, microbiology tests and final diagnosis (invasive bacterial infection [IBI], localised bacterial infection, and confirmed viral infection). We grouped the PCT and CRP values by risk level. For PCT, the levels were: low risk, under 0.5 ng/mL; moderate risk, 0.5–2 ng/mL; and high risk, above 2 ng/mL. For CRP, they were: low risk, 0–5 mg/dL; moderate risk, 5–10 mg/dL; and high risk, above 10 mg/dL.

We observed that 80% of IBIs were associated with PCT levels above 2 ng/mL between 6 and 12 h since fever onset. At this cutoff, specificity was 100% for the 3 time

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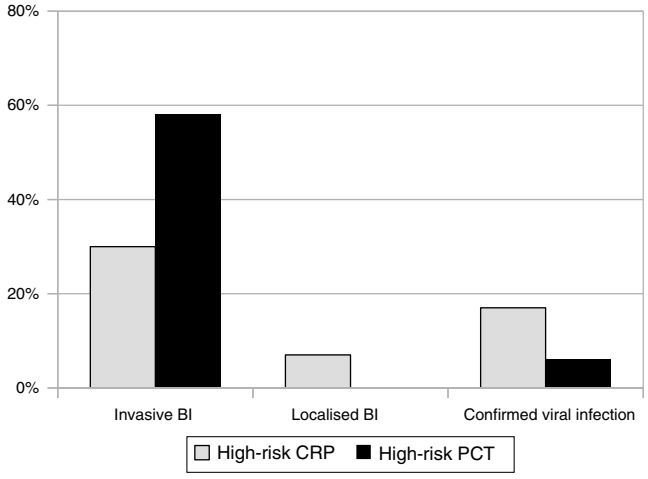
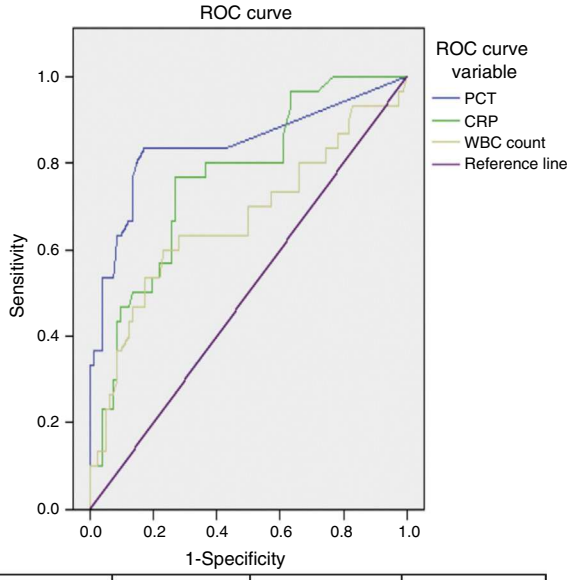


Figure 1 Comparison of high-risk CPR and PCT by diagnosis.

intervals (no viral infection was associated with PCT > 2 ng/mL), while sensitivity was higher in the 6–12 h interval. In this time interval, none of the patients with IBI had a low-risk PCT level, which did happen in 28.6% of patients with IBI in the first 6 h of fever. When we compared CRP and PCT (Fig. 1), we observed that 80% of cases with PCT values above 2 ng/mL corresponded to bacterial infections, while 87.1% of cases with low-risk PCT values corresponded to viral infections. Meanwhile, a CRP value above 10 mg/dL identified only 58% of severe bacterial infections, while 40% of severe bacterial infections were associated with low-risk CRP values in all time intervals. We computed the ROC curves for PCT, CRP and WBC count, and the area under the curve was significantly larger for PCT (Fig. 2). The optimum PCT cut-off value for diagnosing IBI was 0.55 ng/mL, which showed a sensitivity of 80% and a specificity of 85%.

There is a debate as to which markers of infection should be chosen and when they ought to be assessed in cases of fever without a source. Their appropriate use would improve the clinical management of infectious diseases and the rational use of laboratory resources. The results of our study show that PCT offers the best diagnostic yield between 6 and 12 h since onset of fever, and confirms that PCT is a better parameter for early assessment of invasive bacterial infections in the first few hours compared to CRP.

Different studies in the literature refer to the duration of fever and its relationship with infection markers in paediatric practice,[3,4] but the results of this study, which has a prospective design, establish more accurate boundaries for the time interval in which PCT measurement has the best yield. As for comparing PCT and CRP, the literature review by Marín et al[5] obtained an area under the ROC curve for PCT in severe bacterial infections similar to the one found in our study, and higher than the one for CRP. Another study confirmed the superiority of PCT over WBC counts as a marker of serious bacterial infections.[6] We have concluded that PCT facilitates the early detection of bacterial infections, with the associated benefits of early initiation of treatment and the subsequent reduction in complications, and that the optimum time range to determine its



PCT	CRP	WBC count	P
0.840	0.765	0.668	<.001

Figure 2 ROC curves for procalcitonin, C-reactive protein and total leucocyte count for the time interval corresponding to 6–12 h since onset of fever. Area under the curve and statistical significance for the three markers.

levels is between 6 and 12 h since the onset of symptoms. Normal PCT values allow the optimisation of health care resources.

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Forms of clinical presentation of hypothalamic hamartoma☆

Formas de presentación clínica del hamartoma hipotalámico

Dear Editor,

Hypothalamic hamartomas (HHs) are benign tumours composed of ectopic neural and glial tissue. The prevalence is of 1–2 cases per 100 000 inhabitants. HHs can be pedunculated, usually associated to central precocious puberty,[1–3] or sessile, associated with epilepsy with gelastic seizures that are commonly refractory to treatment.[1–3]

We present four cases of HH, which started as precocious puberty in three children and as complex partial seizures and gelastic seizures in one other child.

Of the three patients that presented precocious puberty as the initial symptom, two were female and one male. The girls sought care at ages 2 years (patient 1) and 4 years (patient 2) due to thelarche and accelerated growth rate. Physical examination revealed the patients were at the Tanner II stage. Hormone testing was performed. The results in patient 1 revealed: estradiol, 31.5 pg/mL (normal value [NV], 5–10 pg/mL); follicle-stimulating hormone (FSH), 3.58 IU/mL (NV, 0.50–2.41 IU/L); luteinizing hormone (LH), 0.66 IU/mL (NV, 0.01–0.21 IU/L). The results in patient 2 were: estradiol, 33 ng/L (NV, 5–10 pg/mL) and a maximum peak level of LH after stimulation with gonadotropin-releasing hormone (GnRH) of 29 mIU/mL (NV, <7 IU/L). In both cases, bone age was advanced and pelvic ultrasound showed pubertal morphology of the uterus and adnexa.

The third case corresponded to a male 3 years and 10 months of age (patient 3) that sought care for premature pubarche. Physical examination revealed a Prader testicular volume of 5 mL. Hormone testing showed a maximum peak level of LH after stimulation with GnRH of 13 mIU/mL and a testosterone level of 1.6 ng/mL (NV, 0.02–0.23 ng/mL). Bone age was advanced compared to chronological age.

Brain magnetic resonance imaging (MRI) revealed a pedunculated HH, the size of which was 11 mm in patient 1, 8 mm in patient 2, and 17 mm in patient 3, with all three of them located in the tuber cinereum (Fig. 1). All three cases responded well to treatment with a GnRH analogue.

The last case corresponded to a 6-year-old male (patient 4) that sought care for abnormal movements consisting of sucking, chewing and a fixed gaze, occasionally accompanied by deviations of the corner of the mouth, hypertonia, eye rolling and uncoordinated movements of the four limbs. These movements occurred during sleep, with no particular time pattern, and were interpreted as complex partial seizures. Episodes of unprovoked laughter since infancy compatible with gelastic seizures were reported. Treatment with levetiracetam was initiated, with behaviours worsening and poor seizure control despite administration of optimal dosage, so it was switched to valproate.

The patient had disruptive behaviour both at home and in the school, which led to initiation of treatment with risperidone and methylphenidate.

Brain MRI showed a HH 1.3 cm in size located between the mamillary bodies (Fig. 2). The screening for precocious puberty was negative.

During followup, the patient showed poor seizure control and a worsening of behaviour despite high-dose treatment with a combination of antiepileptic drugs (levetiracetam, valproate, oxcarbazepine and zonisamide), in addition to methylphenidate and risperidone. Due to the poor response to treatment, we decided to perform gamma-knife radiosurgery.

At present, the patient is receiving antiepileptic treatment with valproate and oxcarbazepine, with good seizure control and an improvement in behaviour, so that treatment with risperidone and methylphenidate could be discontinued. He also requires thyroid hormone replacement therapy for central hypothyroidism secondary to radiosurgery.

Most HHs are sporadic, but sometimes they are associated with Pallister–Hall syndrome.[1,2,4] The diagnosis is made by MRI, which shows an isointense lesion with no contrast uptake in the hypothalamic region.

HH has an intrinsic epileptogenic potential, characteristically presenting with gelastic and dacrystic seizures that usually manifest in the early years of life. Other types of seizures difficult to control with pharmacological treatment are also frequent.[1,2] It can also manifest as precocious puberty due to GnRH-releasing neurons in the HH. Treatment with GnRH analogues has shown a high efficacy.[4]

HH is associated with a broad range of neuropsychological symptoms that may include cognitive decline, language delays and learning disabilities, behavioural problems, attention deficit hyperactivity disorder and mood disorders.[1] Epilepsy in the context of HH is typically refractory to pharmacological treatment.

Surgical resection of the mass is associated with a high rate of complications. It is indicated in cases of

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