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LETTERS TO THE EDITOR

Utility of biomarkers to predict bacterial meningitis in elderly patients☆

Utilidad de los biomarcadores para predecir meningitis bacterianas en los pacientes ancianos

Dear Editor:

It was with great interest that we read the study by Morales Casado et al.[1] recently published in *Neurología* and addressing the utility of biomarkers of infection and inflammation (BII; procalcitonin [PCT] and C-reactive protein [CRP]) for predicting bacterial meningitis in the emergency department. Although we agree that both BII have a good predictive ability for detecting bacterial meningitis and differentiating bacterial from viral meningitis,[2] we would like to add further comments regarding the subgroup of patients older than 75. The utility of BII, particularly CRP, in elderly patients is still controversial due to immunosenescence, a process that alters immune response and especially inflammatory response. Elderly patients show higher levels of proinflammatory cytokines (for example, IL-6 and IL-8) against bacterial infection. Likewise, CRP determinations in this population yield a higher rate of false-positive results and have lower sensitivity and specificity for differentiating bacterial from viral infections.[2,3]

As the authors pointed out, although acute meningitis is not ranked among the most frequent infections in the emergency department,[4] it is one of the most severe, as well as one of the types of infection most frequently leading to severe sepsis and septic shock.[5] In the past few years, the incidence of infections in emergency departments has increased significantly ($P < .001$) among the elderly (31.7% vs 24.8%).[4] Clinical severity and mortality in this subgroup have also increased.[6] In this population, suspecting and confirming bacterial meningitis is especially important given the severity of this process and the largely non-specific, highly variable symptoms associated with infectious processes.[3] This results in delayed diagnosis in these patients and leads to administering unnecessary antimicrobial drugs in more than 50% of the cases.[7] In the study by Morales Casado et al.,[1] PCT achieved an excellent diagnostic power for detecting bacterial meningitis, with an area under the ROC curve (AUC) of 0.99, 94% sensitivity, and 100% specificity for a cut-off point of 0.74 ng/mL. CRP was also found to have a good diagnostic power, with an AUC of 0.91; however the cut-off point was higher (90 mg/L) and both sensitivity (67%) and specificity (86%) were lower. We hypothesise that CRP results may be overestimated in this study and reflect the mean age in their sample (44 years). Published evidence shows that: (1) 50-65% of all patients older than 75 have high CRP levels in the absence of underlying infections (false positives)[2,8] upon arriving at the emergency department, and (2) the diagnostic power of CRP decreases in older populations, whereas that of PCT remains the same, as in cases of bacteraemia (including cases of associated bacterial meningitis).[9] We therefore feel that CRP determinations must be interpreted with caution in elderly patients, especially in severe cases such as suspected bacterial meningitis. Over 50% of the patients with fever in emergency departments undergo CRP tests (but not PCT tests)[10] to differentiate between viral and bacterial meningitis, and more than 40% of all infectious processes in emergency departments affect elderly patients. The above suggests that isolated CRP measurements have a very limited diagnostic power in the emergency department for confirming or ruling out a bacterial aetiology of acute meningitis (unlike PCT). We need specific studies analysing the diagnostic power of BII by age group to confirm that the diagnostic ability of CRP is similar to that of PCT in children, decreases in adults, and is limited in elderly patients.[2]

Conflicts of interest

The authors have no conflicts of interest to declare.

References

1. Morales Casado MI, Moreno Alonso F, Juárez Belaunde AL, Heredero Gálvez E, Talavera Encinas O, Julián-Jiménez A. Capacidad de la procalcitonina para predecir meningitis bacterianas en el servicio de urgencias. Neurologia. 2014, http://dx.doi.org/10.1016/j.nrl.2014.07.003.
2. Julián-Jiménez A, Candel-González FJ, González del Castillo J. Utilidad de los biomarcadores de inflamación e infección en los servicios de urgencias. Enferm Infecc Microbiol Clin. 2014;32:177—90.
3. Opal SM, Girard TD, Ely EW. The immunopathogenesis of sepsis in elderly. Clin Infect Dis. 2005;41:5504—12.

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4. Martínez Ortiz de Zárate M, González del Castillo J, Julián-Jiménez A, Piñera Salmerón P, Llopis Roca F, Guardiola Tey JM, en representación del grupo INFURG-SEMES. Estudio INFURG-SEMES: Epidemiología de las Infecciones en los Servicios de Urgencias Hospitalarios y evolución en la última década. Emergencias. 2013;25:368—78.
5. González Martínez F, Huete Hurtado A, Mercedes Kerlin L, Zamora Peña RE. Estudio prospectivo y multicéntrico de la epidemiología de las infecciones del sistema nervioso central (meningitis y encefalitis) en los servicios de urgencias hospitalarios. Neurologia. 2014, http://dx.doi.org/10.1016/j.nrl.2013.10.002.
6. Ruiz-Ramos M, García-León FJ, López-Campos JL. Características demográficas de la mortalidad en los servicios de urgencias hospitalarios de Andalucía. Emergencias. 2014;26:109—13.
7. Nicolás D, Monclús E, de Andrés A, Sánchez M, Ortega M. Características de la prescripción de antibióticos en un servicio de urgencias de un hospital de tercer nivel. Emergencias. 2014;26:367—70.
8. Julián-Jiménez A, Moreno-Alonso F, Morales-Casado MI, Muñoz-López D. Utilidad de procalcitonina y proteína C reactiva para predecir bacteriemia en el paciente anciano o con inmunodepresión. Enferm Infecc Microbiol Clin. 2015;33:366—7.
9. Lai CC, Chen SY, Wang CY, Wang JY, Su CP, Liao CH, et al. Diagnostic value of procalcitonin for bacterial infection in elderly patients in the emergency department. J Am Geriatr Soc. 2010;58:518—22.
10. Salinas M, López-Garrido M, Uris J, Leiva-Salinas C. Variabilidad en la oferta y en la solicitud de determinaciones de laboratorio en pacientes de servicios de urgencias hospitalarios. Emergencias. 2014;26:450—8.

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Utility of EEG findings in the management of a case of herpes simplex encephalitis☆,☆☆

Utilidad de observaciones EEG frecuentes en el manejo de una paciente con encefalitis herpética

Dear Editor:

Electroencephalography (EEG) is a useful assessment tool in critical care units, especially in the case of apparently unexplained changes in the patient's level of consciousness. Herpes simplex encephalitis (HSE) is a serious disease with multiple prognostic factors; the most important of these is probably time elapsed to starting antiviral treatment.[1] Another important factor is the presence of seizures, which affect a significant number of patients[2] and are responsible for a cascade of pathophysiological events that seem to promote brain damage.[3,4] A study by Carrera et al.[5] showed that nearly one third of the patients with central nervous system infections and monitored with continuous EEG (cEEG) experienced seizures; in more than half of the cases, seizures had no clinical manifestation. Furthermore, presence of seizure activity with no clinical changes and a pattern of periodic lateralised epileptiform discharges (PLED) were independent variables of poor prognosis.

We describe the case of a patient with HSE with an aggressive course and complications consisting of epilepsy-related alterations in the level of consciousness. We would like to underscore the importance of frequent and periodic EEG studies in these patients for follow-up, management, and probably also in predicting prognosis.

Our patient was a 56-year-old woman with no relevant medical history who presented fever, progressive disorientation, and decreased verbal fluency upon waking. A cranial CT scan and a CSF analysis conducted at her local hospital yielded normal results. She was admitted and treated with aztreonam, with no significant improvements. On the third day she was transferred to our hospital, a reference centre; she then presented stupor, sensorimotor deficits on the right side of her body, and abolished plantar reflex in the ipsilateral foot. An additional cranial CT scan also displayed no alterations. However, a subsequent lumbar puncture yielded abnormal CSF (96 cells/mm^3 [75% lymphocytes], protein levels 76 mg/dL, and glucose levels 52 mg/dL [glycaemia 137 mg/dL]). We initiated treatment with acyclovir and applied our hospital's EEG monitoring protocol for these cases: at least 2 EEG recordings (3 on some occasions) every 24 hours. The first EEG recording revealed a PLED pattern suggesting HSE. Subsequent EEG recordings evidenced rapid and severe progression of the process and some additional complications (Fig. 1).

1. 1st day of hospital stay: PLED in the left hemisphere, predominantly in temporal areas. We started treatment with levetiracetam.
2. 3rd day of hospital stay: non-convulsive seizures (NCS), which persisted and evolved to generalised

☆ This study has not been presented at the SEN's Annual Meeting or at any other conferences or congresses.
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