Short communication

Papilledema secondary to tuberculous meningitis in a patient with type 1 diabetes mellitus

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ABSTRACT

Case report: The case is presented of a 29-year-old woman who complained of headache over a period of several days, with loss of visual acuity and pain in her left eye. She had a 3-year history of type 1 diabetes mellitus, and was an immigrant from Ecuador. The funduscopic examination revealed a papilledema. The polymerase chain reaction (PCR) study of the cerebrospinal fluid was positive for Mycobacterium tuberculosis (MTB). She showed a marked improvement after treatment with anti-TB drugs.

Discussion: About a third of the world’s population has a latent infection of MTB; comorbidity between diabetes mellitus and tuberculosis has been reported, particularly in undeveloped countries.

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Papileldeama secundario a meningitis tuberculosa en paciente con diabetes mellitus tipo 1

RESUMEN

Caso clínico: Mujer de 29 años de edad, que refería cefalea de varios días de evolución, con posterior pérdida de visión y dolor en su ojo izquierdo. Como antecedentes: diabetes mellitus tipo 1, de 3 años de evolución y ser inmigrante de Ecuador. El examen fundoscópico reveló un papiliedema. La reacción en cadena de la polimerasa (PCR) en líquido cefalorraquídeo fue positiva para Mycobacterium tuberculosis (MTB). Posteriormente al tratamiento con tuberculosisotics presentó una mejoría marcada.

Discusión: La tercera parte de la población mundial presenta una infección latente por MTB; existe una comorbilidad entre diabetes mellitus y tuberculosis, principalmente en los países en vías de desarrollo.

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Introduction

Tuberculous meningitis represents 0.62% of all clinical variants of infection by Mycobacterium tuberculosis (MTB). The incidence is directly related to the prevalence in the community and continues to be the most frequent chronic infection of the central nervous system (CNS) in developing countries. Presentation generally includes the typical meningitis symptoms albeit in a more gradual manner. It generally arises from an area in the brain adjacent to the meninges which originates during primoinfection. Tuberculin test has limited value except in pediatric patients. In the majority of cases chest X-rays are negative.

Clinic case

Female, 29, who referred fatigue and holocranial, intermittent and predominantly morning headache which partially improved with painkillers. The evolution was of about 15 days and subsequently presenting a feeling of oppression at the retrobulbar level and diminished visual acuity in the left eye (LE). Antecedent included diabetes mellitus type 1 with 3 years evolution after diagnostic with moderate metabolic control, thin complexion and recently immigrated from Ecuador.

Physical examination produced best corrected visual acuity (VA) in the right eye (RE) of 1.0 and in left eye (LE) of 0.3. Anterior segment biomicroscopy did not reveal significant data. The funduscopic examination revealed congestive papilla with the presence of splinter hemorrhages and diffuse edges, in addition to venous tortuosity and some dispersed microaneurysms in the posterior pole (Fig. 1). Visual field (VF) revealed annular scotoma in both eyes.

Cranial computerized tomography (CT) with and without contrast did not reveal significant alterations (Fig. 2). Laboratory tests produced the following relevant data: hyperglycemia 265 mg/dl and high numbers for cholesterol and triglycerides.

It was decided to admit the patient and request urgent assessment by the Neurology Service, which completed the physical exploration without relevant clinical findings. It was decided to carry out a lumbar puncture which produced clear liquid with normal pressure (17.5 cm H₂O). Cytobiochemical analysis produces only one leukocyte per mm, glucose at 154 mg/dl and high micro proteins (70 mg/dl).

PCR, cerebrospinal fluid, was positive for MTB. In addition cultures and serologies were requested.

Treatment was initiated with tuberculostatics, applying isoniazid, pyrazinamide, rifampicin and ethambutol in

Fig. 1 – Right eye/left eye fundus: congestive papilla with seesaw edges and splinter hemorrhages.

Fig. 2 – Computerized tomography without significant alterations.
combination. No paradoxical reaction subsequent to administration was observed. In addition, pyridoxine supplement (B6) and corticoids were added. The latter had to be withdrawn due to secondary hyperglycemia. Nuclear magnetic resonance (NMR) and angio-resonance (ANGIO-RM) did not exhibit significant alterations in morphology or signal intensity in orbit, cerebral and cerebellar parenchyma, trunk-encephalus, meninges and venous cavities (Fig. 3). Chest X-ray did not reveal active or latent MTB infection signs (Fig. 4). The tuberculin (Mantoux) test was negative at 72 h.

The patient tolerated the treatment adequately and remained free of symptoms. She was then released to continue the treatment under the Neurology and Ophthalmology Services. She continued with the same treatment for 2 months and subsequently was treated with isoniazid and rifampicin in combination an additional 8 months. Cerebrospinal fluid culture results were negative.

Improvement was observed in a subsequent VF although the annular scotoma in the LE remained, probably due to residual optical atrophy. An optic coherence tomography (OCT) (Cirrus HD, C. Zeiss Meditec, Germany), taken 12 months after beginning treatment, revealed diminished retina nervous fiber layer (RNFL) thickness, mainly involving the LE (Fig. 5).

VA was of 1.0 in RE and 0.8 in LE. The funduscopy examination revealed papilla with well-defined borders, paleness in the neuroretinal ring (NRR), mainly involving the temporal sector of the LE and absence of venous tortuosity (Fig. 6).

Discussion

About one-third of the world population has latent MTB infection. Of these, approximately 10% could exhibit clinical disease in their lifetime. Comorbidity has been observed between diabetes mellitus and tuberculosis, involving the developing countries. In this case, the patient was from Ecuador, which is a risk factor for this type of infection, in addition to being diabetic type 1.

The definitive diagnostic of meningeal tuberculosis was reached by positive culture of the germ in cerebrospinal fluid, even though the result is positive between 50% and 80% of cases and could take between 2 and 8 weeks. For this reason, treatment must be established in a timely manner as waiting for said result could involve irreversible neurological damage or even death.

PCR in the cerebrospinal fluid can provide a fast and highly specific diagnostic, although false negative results could appear if the sample contains a small number of organisms (<2 colony forming units per mL), in addition to featuring a sensitivity between 55% and 60%.

Other causes of infectious papilledema for which differential diagnostic must be made include all acute or chronic CNS infections, taking into account those caused by spirochetes (syphilis, Lyme's disease), fungi (crypto-coccosis, coccidioidomycosis), virus (herpes, cytomegalovirus), toxoplasma gondii and diseases such as brain abscess.
RNFL thickness analysis: Optic disc cube 200x200

OD  ●  OS

RNFL thickness map

RNFL thickness deviation

RNFL TSNIT normative data

Fig. 5 – Optic coherence tomography with diminished retina nervous fiber layer thickness, mainly in the left eye.

Fig. 6 – Papillae with well defined edges, neuroretinal ring paleness in the temporal sector, mainly in the left eye.

Conflict of interests

No conflict of interests has been declared by the authors.

REFERENCES


