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Caso clinico

Case report

Listeria monocytogenes-associated meningitis and arthritis in an immunocompetent 65-year-old woman: a case report

Meningite e artrite da Listeria monocytogenes in una donna immunocompetente di 65 anni: caso clinico

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INTRODUCTION

Listerial infections occur rarely and affect certain high risk groups such as immunocompromised, elderly, pregnant women and newborns [1]. Meningoencephalitis is the most common manifestation of invasive listeriosis [1]. Localised manifestations such as articular bone infections, although unusual, have been reported in patients with prosthetic joints and those receiving immunosuppressive therapy [2]. We report an unusual case of meningitis and infectious monoarthritis caused by *Listeria monocytogenes* in an immunocompetent elderly woman.

CASE PRESENTATION

A 65-year-old Caucasian female was referred via her general practitioner to the Department of Internal Medicine of the Saint George General hospital of Chania, Crete complaining of a 3-days history of vomiting, diarrhea, headache and low grade fever (up to 37.7°C). Her previous medical history was unremarkable without any serious predisposing medical condition. Vital signs on admission were as follows: temperature 38°C, pulse 118 beats/minute, blood pressure 100/70 mmHg and oxygen saturation 97% while she was breathing ambient air. Initial laboratory work up showed leucocytosis, 16.14x10^9 cells/L (normal range 4-11x 10^9 cells/L) with 93% neutrophils and 7% lymphocytes. Biochemical parameters included liver and renal function tests which were normal. Blood glucose was 5.9 mmol/L (normal range: 3.9-6.4 mmol/L). Inflammatory markers were elevated with C-reactive protein, 31.1 mg/dl (normal range 0-0.5 mg/dl) and erythrocyte sedimentation rate, 52 mm/h (normal range 1-20 mm/h). Physical examination disclosed increased bowel sounds and a generalized sensitivity on abdominal palpation. Abdominal Computed Tomography (CT) was normal. An initial diagnosis of febrile gastroenteritis was made. The patient was treated empirically with ciprofloxacin (400 mg twice daily) and metronidazol (500 mg once daily) intravenously (i.v) along with fluids administration. Stool culture was negative.

On the 4th hospital day the patient presented high fever (39.2°C), diminished consciousness, lethargy and confusion. Brain CT imaging was unremarkable. Neurological examination disclosed neck stiffness and positive signs of meningeal irritation (Kernig's or Brudzinski's signs). Examination of the extremities revealed

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edema, tenderness and decreased mobility of the right knee joint.

Lumbar puncture and arthrocentesis were performed. Cerebrospinal fluid (CSF) examination showed an opening pressure of 24.5 cm H_2O (normal range 7-18 cm H_2O), white cells 550 x 10^6 cells/L with neutrophils, 94% and lymphocytes 6%, protein 2.1 g/L (normal range <0.45 g/L) and CSF glucose 2.88 mmol/L (normal range: 2.2-3.8 mmol/L). In arthrocentesis, 40 ml of cloudy inflammatory sinovial fluid was aspirated. Cell count analysis of the sinovial fluid yielded leucocytosis ($65x10^3$ cells/mm^3) with 96% polymorphs. Further laboratory work up with microbiological culture of the CSF, culture of the sinovial fluid aspirate and blood cultures yielded gram positive *Listeria monocytogenes* rods. Gram stain and Ziehl-Neelsen stain of the CSF were also performed and were found negative for the presence of any microorganism. The antimicrobial susceptibility test showed that the organism was susceptible to trimethoprim/sulfamethoxazole, meropenem and resistant to ceftriaxone, ampicillin, amoxicillin and penicillin.

After microbiological confirmation of *L. monocytogenes* meningitis and arthritis, treatment with ciprofloxacin and metronidazole was discontinued and changed to meropenem 6 g/24 h i.v for 3 weeks. Fever subsided on the 5th hospital day and the patient's clinical status recorded a marked improvement. Lumbar puncture was repeated in the 15th hospital day with significant improvement of the CSF previously abnormal findings and sterile culture. Oedema of the knee remised progressively. Immunological tests were also performed. Autoantibody tests, serum immunoglobulin and complement levels, cell mediated immunity tests (CD3, CD4, CD8, CD19) were normal and human immunodeficiency virus test was negative. The woman was discharged after she had completed 21 days of i.v antibiotics in excellent clinical condition.

DISCUSSION

Listeria monocytogenes is a gram positive, non-sporulating, motile bacillus and belongs to a group of pathogens that mainly affects immunocompromised individuals [1]. Listeriosis represents a serious foodborne infection acquired from consumption of undercooked foods, raw vegetables, non-pasteurised cheese and milk [3]. Following ingestion of a contaminated product, after a median 24 hour incubation period a non invasive disease may occur in healthy individuals manifesting as an acute febrile gastroenteritis that lasts usually 2 days [3]. At this stage invasive complications of listeriosis rarely occur in healthy individuals and clinical recovery is generally complete [3]. However, in case of immunodepression, listeriosis invades the mesenteric lymphnodes and the bloodstream [1]. Malignancy is the main predisposing risk factor [1]. Remarkably, more than one third of listerial infections occur in patients with neoplasm [1]. An increased risk for opportunistic listerial infections has been also reported for patients receiving biological immunomodifying agents [4].

Here we reported an unusual case of listeriosis in an immunocompetent elderly woman manifested with concurrent meningitis and arthritis. In regards to listerial meningitis, it is unusual in immunocompetent adults and children and accounts for less than 5% of all cases of acute meningitis [5]. Similarly, articular listeriosis represents a rare clinical occurrence which is usually manifested as monoarthritis of a large joint such as knee or hip [2]. A literature review performed by Schett et al. disclosed only 29 reported cases with *Listeria monocytogenes* associated arthritis. Most of the patients had underlying conditions such as malignancies, diabetes, rheumatic diseases and prosthetic joints [2]. Remarkably, two out of 3 of the reported cases of listerial infection occurred in prosthetic joints [2]. However, in subjects without any type of deficient cell-mediated immunity and without the presence of a joint prosthesis, articular listeriosis is extremely rare [2]. The management consists of administration of antibiotics i.v. and surgery when necessary resulting to complete resolution of inflammation symptoms [2].

To the best of our knowledge this is the first case of listeriosis manifested with meningeal irritation and arthritis simultaneously in a patient not previously undergoing immunosuppressive therapy. Patient's age (≥60 years old) was the only predisposing risk factor for infection from *L. monocytogenes* [1]. Listerial infections, although rare, can become fatal if not diagnosed and properly managed with appropriate antibiotics. It is remarkable that mortality rates depend on clinical features and patient's age and has been reported to be higher than 10% [6]. Combination of ampicillin and amino-

glycoside is considered the preferred therapeutic antibiotic regimen [6]. Meropenem represents a useful therapeutic option in case that patient is allergic to ampicillin or the later has inadequate effect although failures of meropenem to treatment have been also reported [7, 8]. This case emphasizes the necessity of physicians' awareness regarding clinical manifestations of listeriosis in order to establish a prompt diagnosis. A high index of suspicion is required, especially for elderly patients admitted with fever and neurological deterioration preceded by a self-limited gastroenteritis.

Informed Consent
Written informed consent was obtained from the patient for publication of this manuscript and accompanying images. A copy of the written consent form is available for review by the Editor-in-Chief of this journal.

Conflict of interest declaration
On behalf of all authors, the corresponding author states that there is no conflict of interest.

Keywords: *Listeria monocytogenes*, meningitis, arthritis.

SUMMARY

We report an unusual case of concurrent meningitis and infectious monoarthritis due to *Listeria monocytogenes* in a 65-year-old woman presenting to our department with a transient gastrointestinal tract illness.
During hospitalization the patient's neurological status deteriorated, presenting signs of meningeal irritation along with signs of inflammation and oedema of the right knee. Blood cultures and cultures of the cerebrospinal fluid and of the sinovial fluid aspirate showed growth of *L. monocytogenes* gram positive rods. The patient received a three-week course of intravenous meropenem with significant improvement. To the best of our knowledge this is the first case of concurrent listerial meningitis and arthritis in an immunocompetent patient.
Despite the rarity of the disease in healthy individuals a high index of suspicion is required for unusual manifestations of listerial infections especially among high risk groups such as the elderly.

RIASSUNTO

Nel presente articolo riportiamo un insolito caso di meningite e monoartrite infettiva da Listeria monocytogenes *in una donna di 65 anni giunta alla nostra osservazione con disturbi transitori a carico del tratto gastrointestinale. Nel corso dell'ospedalizzazione, lo status neurologico della paziente si è deteriorato e sono comparsi segni di irritazione meningea congiuntamente a segni di infiammazione ed edema del ginocchio destro. Gli esami colturali effettuati su sangue, liquido cerebrospinale e sinoviale hanno evidenziato la crescita di bacilli gram positivi,* L. monocytogenes. *Dopo un ciclo di trattamento di tre settimane con meropenem per via endovenosa, la paziente ha mostrato un miglioramento significativo. Per quanto ci è dato sapere, si tratta del primo caso descritto in letteratura di meningite e concomitante artrite settica da* Listeria monocytogenes. *Benché tale patologia sia di rara osservazione nei soggetti sani, è tuttavia necessario sospettarne la presenza quando ci si trovi di fronte a manifestazioni inusuali, soprattutto in pazienti ad alto rischio quali gli anziani.*

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