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Is there an association between mesenteric panniculitis and lymphoma? A case control analysis☆

V. Khasminsky [a,b,e], E. Ram [b,c,e], E. Atar [a,b], A. Steinminz [b,d], N. Issa [b,c], G.N. Bachar [a,b,*]

[a] Department of Diagnostic Imaging, Rabin Medical Center, Petach Tikva, Israel
[b] Sackler Faculty of Medicine, Tel Aviv University, Tel Aviv, Israel
[c] Department of Surgery, Rabin Medical Center, Petach Tikva, Israel
[d] Institute of Nuclear Medicine, Rabin Medical Center, Petach Tikva, Israel

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AIM: To determine the prevalence and association of mesenteric panniculitis (MP) in a group of patients with non-Hodgkin's lymphoma (NHL) compared to control group.

MATERIALS AND METHODS: We retrospectively evaluated computed tomography (CT) and combined positron-emission tomography (PET) with CT examinations of a total of 166 patients who were diagnosed with NHL over a period of 5 years (2008–2013). The control group consisted of 332 subjects who were matched for gender and age at the time period the examinations were performed on the study group. A combination of radiological signs and absence of 2-[^{18}F]-fluoro-2-deoxy-D-glucose (FDG)-uptake was used to establish the diagnosis of MP and distinguish it from the involvement of mesentery by lymphoma.

RESULTS: MP was identified in three patients (prevalence 1.8%) from the study group as compared to seven subjects out of 332 (2.1%) in the control group (p=0.556). During the course of follow-up no changes in the imaging features of MP were seen in either group. Additionally, 27 (16.2%) patients from the study group were found to have changes in the mesentery, which were attributed to the involvement of the mesentery in the primary disease.

CONCLUSION: The prevalence of MP among patients with NHL was found to be 1.8%, which corresponds to the range of its prevalence in the general population. This is contrary to the proposition that MP is associated with NHL.

Introduction

Mesenteric panniculitis (MP) is a term describing a spectrum of non-specific inflammatory and fibrotic processes affecting mesenteric adipose tissue. It encompasses a range of conditions synonymous with MP such as mesenteric lipodystrophy and sclerosing mesenteritis, which probably represent different stages of the same pathological process[1–3]; however, the sclerosing or fibrotic variety of MP

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* Guarantor and correspondent: G.N. Bachar, Department of Radiology, Rabin Medical Center, Petach Tikva 49100, Israel. Tel.: +972 3 937 2219; fax: +972 3 937 2550.
E-mail address: drbachar@netvision.net.il (G.N. Bachar).

[e] These authors contributed equally to this study.

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is rarely, if ever, seen in radiological practice. The aetiology of MP remains unknown. Several causes, such as autoimmune, paraneoplastic, or non-specific inflammatory reactions, as well as previous abdominal trauma or surgery have been proposed to account for its development.[4]

The condition is usually discovered incidentally, either on abdominal computed tomography (CT) or at surgery.[3,5–7] MP possesses a number of distinctive imaging characteristics that enable its diagnosis on abdominal CT.[3,8] The prevalence of MP in the literature varies from 0.16% to 7.83%, as suggested by a number of clinical studies,[5–7,9–13] while an autopsy series reported its prevalence to be 1%.[14]

Although its exact aetiology and pathogenesis remain incompletely elucidated, several authors have suggested a certain connection between MP and malignancy.[4,5,11–20] These studies found the prevalence of malignant disease to be between 56% and 75% in groups of patients with MP.[4,5,11] In light of the possibility that MP might indicate a presence of malignancy, some authors consider discovering MP to be a reason to search for malignancy or at least to perform imaging follow-up[4,11,13]; however, the association between MP and neoplasia remains a subject of dispute. There are a number of studies showing the prevalence of malignancy in MP to be <33%.[2,6,7] Moreover, two studies were published recently, which arrived at an explicit conclusion that MP is neither a paraneoplastic process, nor is it associated with other malignant diseases.[10,12] It appears that the nature of the connection between MP and malignancy has not yet been conclusively established. The majority of previous studies have investigated the association between MP and malignancy by establishing the prevalence of malignancy in a group of patients with signs of MP.[4,5,11,13] In the present study a different approach was taken with the aim of determining the prevalence of MP among patients with non-Hodgkin's lymphoma (NHL). The assumption was that if MP is indeed a paraneoplastic process or is associated with NHL in any other way, then it would be expected that its prevalence is increased among the patients with lymphoma compared to a control group. NHL was chosen because it frequently appears to be one of the most prevalent types of malignancy associated with MP according to other studies.[2,4–6,9,11,12]

Materials and methods

Patients

All available CT and combined positron-emission tomography (PET) with CT examinations of 166 consecutive patients who were diagnosed with NHL between the years 2008 and 2013 were evaluated retrospectively. The patients were from one institution, which is a tertiary referral centre (Rabin Medical Center, University Hospital). The cohort included 113 men and 53 women; with ages ranging from 19 to 94 years (mean age 64 years). The diagnosis of NHL was established before or during the research period and was histologically proven for all study patients. The initial PET-CT images were obtained prior to the initiation of chemotherapy. Patients with Hodgkin's lymphoma were not included in the study as, to the authors' knowledge, it has never been described as associated with MP. Every patient with NHL was matched with two subjects who underwent abdominal CT without oral or intravenous contrast medium administration who were examined for renal colic in the Emergency Department during the same period of time (2008–2013). The control subjects were randomly chosen from a database and matched for gender, age, and the time period of the CT examination. The control group included a total of 332 subjects, 226 men and 106 women with a mean age of 65 years. None of the control group patients underwent PET-CT examination before or during the study period. The study was approved by the institutional review board.

Imaging protocols

For the PET-CT examination patients received an intravenous injection of 13.5 mCi (500 MBq) of 2-[^{18}F]-fluoro-2-deoxy-D-glucose (FDG). Following the FDG injection, an uptake interval of 60 minutes was observed after which a static PET-CT examination of the body (skull-base to mid-thigh) was performed (Discovery STE, 8-detector row, GE Medical Systems, Milwaukee, WI, USA). Patients without contraindications to intravenous contrast material were injected with 80–100 ml iopromide 0.623 g/ml (Ultravist 300; Bayer Healthcare, Bayer Pharma AG, Berlin, Germany) at a rate of 1.5 ml/s using an automatic power injector and a CT scan of the body (from skull-base to mid-thigh) was acquired after a 70-second delay. All of the CT examinations of the control group subjects were performed at the same institution on a 16-section Philips MX8000IDT CT system, according to a protocol of both oral intake of 4% meglumine ioxitalamate (Telebrix, Telebrix Gastro, Guerbet, Roissy CDG Cedex, France) diluted in 1 l of drinking water approximately 2 hours before the examination and a 100 ml intravenous bolus of iohexol (Omnipaque, GE Healthcare Ireland, Cork, Ireland) injected 80 seconds pre-scan at 3.5 ml/s with the help of an automatic power injector.

Interpretation

All CT and PET-CT studies were viewed by two experienced abdominal radiologists who agreed upon the presence and grade of the MP. Furthermore, all PET-CT examinations were reviewed by a nuclear medicine specialist for the purpose of distinguishing between MP and lymphomatous involvement of the mesentery. MP was identified using five criteria established by previous studies, as follows: mesenteric fat of inhomogeneously higher attenuation than adjacent retroperitoneal fat, containing small soft-tissue nodules up to 1 cm in short axis, which are surrounded by a hypo-attenuating "halo", also seen around mesenteric blood vessels. The whole of the involved area possesses a hyperattenuating pseudo-capsule and has a mild "mass effect" on the surrounding tissues. The presence of MP was considered to be established when at least three out of the five above mentioned five signs were observed.[4,5,7,13]

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