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Why do cat flea infestations often occur on the upper limbs and trunk? Fleas do not fly…

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Dear Editor,

Some species of fleas belonging to the genera *Ctenocephalides*, *Pulex*, and *Xenopsylla* can infest human skin.[1-3] Multiple, isolated or clustered, roundish, erythematous, pruritic papules are the most typical clinical presentation of flea infestation.[1-14] These lesions are very often located on the legs and ankles, as fleas are wingless but have powerful hind legs that allow them to leap up to 30 cm from the ground.[1]

We present nine cases of cat flea (*Ctenocephalides felis felis*, Siphonaptera: Pulicidae) infestation located on the upper limbs and trunk, discussing the reason for these locations.

Nine Caucasian patients, five males and four females, with an age ranging from 6 to 54 years (mean age: 43.3 years) were admitted with a clinical diagnosis of suspected entomodermatitis. Dermatological examination revealed dermatitis involving the arms, breasts, abdomen, and flanks in all cases, characterized by multiple, isolated or clustered, roundish, erythematous papules (Figure 1). All patients complained of severe itching. The medical history indicated that all patients owned cats and were accustomed to watching television with their cats on their laps, which justified the locations of the lesions. A clinical diagnosis of cat flea infestation was made, and specimens of live or dead adult cat fleas were found in the beds, couches, and armchairs of 7 patients. In addition, a few dead larvae were identified, and both live and dead adult fleas, as well as occasional dead larvae, were also collected from cat kennels. Enzyme-linked immunosorbent assay for specific IgE to *Ctenocephalides felis felis* was performed in 2 patients (husband and wife): the woman had high levels of specific IgE, whereas the man had levels within normal ranges.

All patients were successfully treated with hydrocortisone butyrate cream (2 applications/day) and hydroxyzine (25 mg/day) for 5-10 days. All cats were simultaneously and successfully treated with topical products containing fipronil and permethrin. Pest control was carried out in patients' houses by means of deltamethrin. Follow-up (up to 6 months) was possible in 6 out of 9 patients and yielded negative results.

Papular urticaria is the most common clinical manifestation of cat flea bites. It is characterized by erythematous, papular, urticarial, and pruritic lesions.[4-8,10-14] Other reported skin reactions include maculopapular rashes[8,11] and, bullous lesions.[15] Important outbreaks of cat flea infestations have been documented in families,[7] childcare facilities,[5] student hostels,[11] homeless populations, and hospitals.[12] Immuno-allergological studies were carried out in individuals with suspected cat and/or cat flea allergy.[16-18] In particular, cat flea-specific IgE antibodies were measured in serum samples from patients with suspected cat allergy using the radioallergosorbent test (RAST). Results showed that 46% of patients were RAST-positive for both cat and cat flea antigens, while 9% were RAST-positive only for cat flea antigens. These results showed that some patients with cat allergy had specific IgE to both cats and cat fleas, whereas others with suspected cat allergy had specific IgE to cat fleas only.[16] It is possible that Cte f 2, a recombinant salivary antigen of *Ctenocephalides felis*, has a role in patients with papular urticaria.[18] In summary, cat flea infestation of the upper limbs and trunk occurs more frequently than previously acknowledged. Its diagnosis is based on: i) a careful medical history; ii) the appearance of roundish, erythematous papules, accompanied by severe itching; iii) the presence of cats in the houses and the way the patient interacts with them; and iv) the presence of fleas, larvae, and eggs in beds, couches, armchairs, and kennels. Differential



Figure 1. Widespread papular-erythematous lesions due to cat fleas on the arm (**a**), breasts (**b**), and flanks (**c, d**).

diagnosis of papular urticaria due to cat flea bites includes skin infestations caused by: i) *Cimex lectularius* (bedbugs), which cause 2-4 roundish, erythematous, pruritic papules or wheals, typically arranged in a single row; a characteristic and unpleasant odor is noted when bedbugs are crushed; dogs and cats are usually absent from the home environment;[2,3,19] ii) *Sclerodermus domesticus*, which produces roundish, erythematous papules, accompanied by a more or less severe burning sensation or pain; this infestation is considered an occupational disease in antiquarians and restorers;[20,21] and iii) *Cheyletiella* sp., which causes erythematous papules and wheals, sometimes tiny vesicles, accompanied by severe itching; scratch lesions are not rare.[1]

Patient perspective

"I was relieved that the treatment worked quickly and effectively and that the itching disappeared within a few days. Once the cause was identified, I took the necessary preventive steps at home and with my cat to ensure the problem wouldn't recur".

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Ethics approval and consent to participate: the study was conducted in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national), with the Helsinki Declaration of 1975, as revised in 2000, and with the Taipei Declaration. In accordance with the guidelines of our institution's ethics committee, and given the nature of the study, formal approval was not required. All participant provided informed consent to participate.

Consent for publication: the patients gave their written consent to use their personal data for the publication of this report and any accompanying images.

Availability of data and materials: anonymized data will be shared upon reasonable request from any qualified investigator for purposes of replicating procedures and results. All data generated or analyzed during this study are included in this published article.

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