



ELSEVIER

Journal of the European Academy of Dermatology and Venereology
6 (1996) 173-178

JEADV
JOURNAL OF THE EUROPEAN ACADEMY
OF DERMATOLOGY AND VENEREOLOGY

Case report

Papular-purpuric "gloves and socks" syndrome

César Martins *, Margarida Gonçalo, Angelina Mariano, A. Poiares Baptista

Department of Dermatology, University Hospital of Coimbra, P-3000 Coimbra, Portugal

Abstract

Papular-purpuric "gloves and socks" syndrome is a recently isolated acute self resolving disease. It is characterised by symmetrical cutaneous lesions on the hands and feet, with a sharp limit at the wrists and ankles, presenting a gloves and socks look. Lesions begin as a pruritic oedema and erythema and turn purpuric. Oral mucosal lesions, high fever and arthralgia are also present. Parvovirus B19 has been implicated in this exanthematic disease in about 50% of the cases. We recently observed two typical cases of this syndrome; only one patient had serologic evidence of recent infection by Parvovirus B19.

Keywords: Papular-purpuric "gloves and socks" syndrome; Parvovirus B19

1. Introduction

In 1990, Harms et al. reported five patients suffering from a self-limiting febrile dermatosis characterized by oedema, erythema and purpuric lesions of the hands and feet in a typical "gloves and socks" distribution [1]. Serologic studies did not support the probable viral etiology and the entity was called papular-purpuric "gloves and socks" syndrome (PPGSS). One year later, Bagot et al. identified serum IgM against Parvovirus B19 in a patient presenting similar clinical features, and suggested the correlation between this dermatosis and primary infection by this virus [2].

In 1975, Parvovirus B19 was identified in the sera of healthy blood donors [3] and six years

later it was implicated as an etiologic agent in human pathology, namely in transient aplastic crisis in patients with sickle cell anemia [4]. This small virus uses, for its own replication, the genetic machinery present in cells during the S phase of the mitotic cycle, especially in the erythroid precursors [5], which then suffer a cytotoxic effect [6]. Therefore, there is a higher susceptibility for patients with an increased turnover of the erythroid series [5,6], namely those with hemolytic anemia or bone marrow aplasia, and for the fetus, which suffers erythrocyte destruction and consequent congestive heart failure in utero (fetal hydrops) with an increased risk of fetal death or abortion [5-8]. In 1983, this virus was implicated in the pathogenesis of erythema infectiosum (5th disease) [9] and its natural clinical history was well described during an epidemic in London [10,11]. Later, it was reported as the probable agent of some cases of seronegative

* Corresponding author. Tel.: (351-39) 400420; fax: (351-39) 400490.



arthritis, especially in adults [5,6], rubelliform and purpuric exanthems [12], as well as in the pathogenesis of Henoch-Schonlein purpura [13]. Recently, its role as an agent of PPGSS has been discussed [17].

2. Case reports

In a short period of time we observed PPGSS in two male patients, 51 and 28 years old (patients 1 and 2, respectively), residents in different areas of Portugal. Both had 3 days of fever (38–39.5 °C) and, afterwards, erythema, pruritus and oedema of both palms and soles accompanied by muscle and joint pain. They denied drug ingestion, blood transfusions, exposure to toxins or contact with individuals with similar pathology. They were observed for the first time on the 4th day of evolution, with erythematous and purpuric painful lesions, symmetrically localized on the hands and feet with a well-defined limit at the wrists and ankles, resembling gloves and socks (Figs. 1, 2, 3). Patient 2 had also discrete maculopurpuric lesions on the inner aspect of his thighs. Petechial lesions of the soft palate were observed in both patients (Fig. 4). The remaining physical examination was normal.

Laboratory studies, including hemoglobin level, hematocrit, platelet count, coagulation tests, blood urea nitrogen, serum creatinine, total serum protein, glucose, erythrocyte sedimentation rate, C-reactive protein, anti-streptolysin O titer, β -2 microglobulin and rheumatoid factor were all within normal limits. Serologic studies, performed to identify serum antibodies against *Rickettsia conori*, *Mycoplasma*, virus Influenza A and B, Parainfluenza 1 and 3, respiratory syncytial virus, Adenovirus, Coxsackie B1, B2, B3, B4, B5, B6, measles and hepatitis B virus were negative. In patient 1 we detected, by counterimmunoelectrophoresis, IgM (1:32) and IgG (1:64) against

Parvovirus B19, indicating recent infection by this virus. We did not perform viral cultures.

In the histologic examination, performed on patient 1, we observed an intracorneal hemorrhagic blister containing picnotic neutrophils, focal acanthosis, colloid bodies and focal vacuolar degeneration of the basal layer. The dermis was edematous and infiltrated with lymphocytes showing marked perivascular and periadnexial distribution.

General symptoms disappeared by the 3rd day. Cutaneous lesions cleared completely by the 2nd week after palmo-plantar desquamation in large lamellar scales. Patient 1, in whom Parvovirus infection was proven, was observed 2 months later. The skin had completely cleared and there were no signs of joint involvement.

3. Discussion

Cutaneous lesions as well as the general symptoms and the clinical evolution observed in these two patients are typical PPGSS, of which we have found, so far, 19 published cases [1,2,14–22]. This syndrome affects mainly adults between 20 and 40 years old and is manifested by a purpuric erythema of hands and feet, resembling “gloves and socks”, often accompanied by an enantheme (oral erythema or erosions). However, skin involvement can be more extensive with petechial lesions of the thighs and trunk [1,15–19], or it may associate different lesions ranging from vesico-pustules [23] to a morbiliform exanthem [14]. Mucous involvement is described in some cases as angular cheilitis [1,18,21], Koplik spots [14] or pharyngeal hyperemia [1,18]. This syndrome is benign and self-limiting with rapid evolution to desquamation and total resolution in about 2 weeks. Fever and joint pain can precede cutaneous lesions by 1 week, but they slowly disappear after 7–10 days. Lymph node enlarge-

Fig. 1. Erythematopapular eruption in a glove and sock-like distribution.

Fig. 2. Erythematous and purpuric lesions on the feet.



ment may be present [2,16,23]. Laboratory studies are usually within normal limits, however a mild anemia [1], leukopenia [1,15,16,23], or thrombocytopenia [2] can be detected, reflecting the cytotoxic effect of the virus on the bone marrow. Hepatic function can be temporarily affected [14,16] as well as the complement system [15,21]. Cutaneous histology is not specific, revealing epidermal alterations – keratinocyte necrosis [23], mild acanthosis [1], hydroptic degeneration of the basal layer [18] – and dermal abnormalities – papillary edema [18,23], lymphocytic perivascular infiltration [1,14,18] and/or vasodilatation without any signs of vasculitis [14,16,18,23]. In 9 of the 19 published cases, serologic tests revealed recent infection with Parvovirus B19 [2,14–17,21,23]. However, 8 of these 19 patients did not present IgM against this virus [17,18,22,24], and, in 2, recent infection by measles virus [19] and Coxsackie B6 virus [17] was diagnosed. This data can be applied to our observation as only one of our patients had serologic evidence of acute infection by Parvovirus B19.

These controversial observations instigated debate about the possible pathogenesis of PPGSS. If a parallel could be established between this entity and erythema infectiosum, after an asymptomatic period of 10 days (the incubation phase), a viremic phase of about 1–2 weeks is detected corresponding to the “flu-like” syndrome. After this, we can detect the immunological response, with serum IgM and IgG against the virus, clinically expressed by the presence of a cutaneous exanthem, an enanthem and arthralgia [25–28]. Thus, considering this data applicable to PPGSS, confirmation of Parvovirus B19 involvement must be based on direct identification of the virus (“in situ” hybridization or polymerase chain reaction) in the period which precedes the cutaneous findings or by indirect methods (titles of specific immunoglobulins) after the onset of the dermatosis [29,30]. However, the detection of other viruses by Feldmann et al. [17] and Ferriols et al. [19] in

two typical clinical cases of PPGSS is the main argument against the theory of the exclusive involvement of Parvovirus B19 in this entity. Thus, more than an individualized entity, PPGSS could simply express a cutaneous reaction to different viruses, especially Parvovirus B19, or to other agents, as already mentioned by the authors of the original cases [17].

References

- [1] Harms M, Feldmann R, Saurat J. Papular-purpuric “gloves and socks” syndrome. *J Am Acad Dermatol* 1990;23:850–854.
- [2] Bagot M, Revuz J. Papular-purpuric “gloves and socks” syndrome: Primary infection with parvovirus B 19? *J Am Acad Dermatol* 1990;25:341.
- [3] Cossart YE, Field AM, Cant B, et al. Parvovirus-like particles in human sera. *Lancet* 1975;i:72–73.
- [4] Pattison JR, Jones SE, Hodgson J, et al. Parvovirus infections and hypoplastic crisis in sickle cell anaemia. *Lancet* 1981;i:664–665.
- [5] Hogan PA, Morelli JG, Weston WL. Viral exanthems. *Current Problems in Dermatology* 1992;4:35–94.
- [6] Chorba T, Anderson LJ. Erythema Infectiosum (Fifth Disease). *Clinics in Dermatology* 1989;7:65–74.
- [7] Anand A, Gray ES, Brown T, et al. Human parvovirus infection in pregnancy and hydrops fetalis. *N Eng J Med* 1987;316:183–186.
- [8] Torok TJ. Human parvovirus B19 infections in pregnancy. *Pediatr Inf Dis J* 1990;9:772–776.
- [9] Aderson M, Jones S, Hoch SP, et al. Human parvovirus. The cause of erythema infectiosum (fifth disease)? *Lancet* 1983;ii:1378.
- [10] Reid D, Brown T. Human parvovirus-associated arthritis: a clinical and laboratory description. *Lancet* 1985;i:422–425.
- [11] Plummer FA, Hammond GW, Forward K, et al. An erythema infectiosum-like illness caused by human parvovirus infection. *N Engl J Med* 1985;313:74–79.
- [12] Mortimer PP, Cohen BJ, Buckley MM, et al. Human parvovirus and the fetus. *Lancet* 1985;ii:1012.
- [13] Lefrère JJ, Couroucé AM, Muller JY, et al. Human parvovirus and purpura. *Lancet* 1985;ii: 730–731.
- [14] Evans LM, Grossman ME, Gregory N. Koplick spots and a purpuric eruption associated with parvovirus B19 infection. *J Am Acad Dermatol* 1992;27:466–467.
- [15] Dinerman JL, Corman LC. Human parvovirus B19

Fig. 3. Symmetric edema and erythema of the palmar surface of the hands, limited to the wrists.

Fig. 4. View of the petechial oral eruption.

- arthropathy associated with desquamation. *Am J Med* 1990;89: 826-828.
- [16] Halasz CL, Cormier D, Den M. Petechial glove and sock syndrome caused by parvovirus B19. *J Am Acad Dermatol* 1992;27: 835-838.
- [17] Feldmann R, Harms M, Saurat J. Papular-purpuric "gloves and socks" syndrome: not only Parvovirus B19. *Dermatology* 1994; 188:85-87.
- [18] Trattner A, David M, Tiqva P. Purpuric "gloves-and-socks" syndrome: Histologic, immunofluorescence, and polymerase chain reaction study. *J Am Acad Dermatol* 1994;30: 267-268.
- [19] Ferriols A, Aparicio A, Boniche A. Papular-purpuric "gloves and socks" syndrome caused by measles virus. *J Am Acad Dermatol* 1994;30:291.
- [20] Harms M, Feldmann R, Saurat JH. Papular-purpuric "gloves and socks" syndrome caused by measles virus (Reply). *J Am Acad Dermatol* 1994;30:292.
- [21] Bessis D, Lamaury I, Jonquet O, et al. Human parvovirus B19 induced papular-purpuric "gloves and socks" syndrome. *Eur J Dermatol* 1994;4:133-134.
- [22] Cassinotti P, Perrenoud D, Frenk E. Papular-purpuric "gloves and socks" syndrome. *Int J Dermatol* 1994;33: 196-197.
- [23] Naides SJ, Piette W, Veach LA, et al. Human parvovirus B19-induced vesiculopustular skin eruption. *Am J Med* 1988;84: 968-972.
- [24] Harms M, Feldmann R, Saurat JH. Papular-purpuric "gloves and socks" syndrome: Primary infection with parvovirus B 19? (Reply). *J Am Acad Dermatol* 1990;25:341-342.
- [25] Anderson LJ. Role of parvovirus B19 in human disease. *Pediatr Inf Dis J* 1987;6:711-718
- [26] Thurn J. Human parvovirus B19: historical and clinical review. *Rev Inf Dis* 1988;10:1005-1011.
- [27] Woolf AD, Campion GV, Chishick A, et al. Clinical manifestations of human parvovirus B19 in adults. *Arch Intern Med* 1989;149:1153-1156.
- [28] Anderson S. Human parvoviruses. *J Inf Dis* 1990;161: 603-608.
- [29] Anderson LJ, Tsou C, Parker R, et al. Detection of antibodies and antigens of human parvovirus B19 by enzyme-linked immunosorbent assay. *J Clin Microbiol* 1986;24: 522-526.
- [30] Lee PC, Hallsworth P. Rapid viral diagnosis in perspective. *Br Med J* 1990;300:1413-1419.