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Original article

Investigation of a suspected outbreak of *lipoatrophia semicircularis* in children☆

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ABSTRACT

Background and objective: Recent reports of outbreaks of *lipoatrophia semicircularis* (LS) in various countries have generated discussion regarding the potential role of the environmental characteristics of office workplaces in new buildings. The objective of this study was to investigate a suspected outbreak of LS among children in a public school in Barcelona, which generated tremendous alarm.
Methods: We performed an epidemiological assessment including descriptive and prevalence analyses, and an environmental investigation followed by a psychiatric assessment according to Small's criteria. We compared the prevalence of LS and its 95% confidence interval between children and staff attending the day-care centre under study and other centres.
Results: Among 86 children attending a day-care centre we detected 11 confirmed and 2 possible cases of LS (15.1%) while among 41 children attending other day-care centres we identified 8 cases and 4 possible cases (29.3%) ($p = 0.10$). Among 12 day-care staff, we detected 8 cases of LS (66.7%) while among 19 women working different jobs we identified 14 with the same condition as the staff (73.7%) ($p = 0.98$). All lesions were finally classified as indentations with different locations. The environmental evaluation didn't identify any exposure factors with a significant role in the onset of the outbreak. The outbreak shared 13 of Small's 16 criteria regarding epidemic somatoform disorder ("mass hysteria").
Conclusion: The presence of indentations can be considered a normal variant in the lower extremities of children. The characteristic development of the process leads us to the conclusion that this outbreak was an epidemic somatoform disorder.

Investigación de una sospecha de brote de lipoatrofia semicircular en niños

Palabras clave:
Lipoatrofia semicircular
Brote
Niños
Trastorno somatoforme epidémico
Histeria colectiva

RESUMEN

Antecedentes y objetivo: Los informes recientes sobre brotes de lipoatrofia semicircular (LS) en diversos países han generado debate acerca del papel potencial de las características ambientales de los puestos de trabajo en los nuevos edificios. El objetivo de este estudio fue investigar la sospecha de un brote de LS entre los niños de una guardería pública de Barcelona, lo cual generó una tremenda alarma.
Métodos: Realizamos una valoración epidemiológica, incluyendo análisis descriptivo y de prevalencia, y una investigación ambiental seguida de una valoración psiquiátrica de acuerdo con los criterios de Small. Comparamos la prevalencia de LS y su intervalo de confianza del 95% entre los niños y entre el personal de la guardería en estudio, y con otros centros.

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Resultados: Entre los 86 niños que acudieron a la guardería detectamos 11 casos confirmados y 2 casos posibles de LS (15,1%), y entre los 41 niños que acudieron a otros centros identificamos 8 casos confirmados y 4 casos posibles (29,3%) (p = 0,10). Entre el personal de la guardería, detectamos 8 casos de LS (66,7%), y entre las 19 mujeres que trabajaban en otros sitios identificamos 14 con la misma condición que el personal (73,7%) (p = 0,98). Se clasificaron finalmente todas las lesiones como hendiduras con diferentes localizaciones. La evaluación ambiental no identificó ningún factor de riesgo con relación significativa con la aparición del brote. Dicho brote compartió 13 de los criterios de Small en relación con el trastorno somatoforme epidémico («histeria colectiva»).
Conclusión: La presencia de hendiduras puede considerarse como una variante de la normalidad en las extremidades inferiores de los niños. El desarrollo característico del proceso nos conduce a la conclusión de que este brote fue un trastorno somatoforme epidémico.

Introduction

Lipoatrophia semicircularis (LS) is a dermatological condition characterized by asymptomatic horizontal depressions of 1–2 cm in length usually across the anteromedial thighs, although it may also occur on the arms and abdomen. It appears to be more common in women but the exact prevalence is unknown as it may easily go unnoticed.[1,2]

Outbreaks of LS have been reported in various countries, including Belgium, The Netherlands, France, Italy, the United Kingdom and Spain,[3–5] mainly in the context of office workplaces in new buildings with similar environmental characteristics. It has been hypothesized that LS is the result of repetitive microtrauma involving chairs, tables or other workplace surfaces in an environment with high electromagnetic fields and electrostatic charges.

Lipoatrophia has been described among children in various settings, including: "Sock-line" lipoatrophia on the legs secondary to the pressure of socks[6]; lipoatrophia centrifugalis abdominalis, an idiopathic condition characterized by a depressed line on the abdomen or chest of young children that progresses centrifugally[7]; lipoatrophia secondary to trauma; and Lupus profundus related lipoatrophia.[8] LS of the thighs has been reported only once in children,[9] and to date there is no evidence of an LS outbreak in children that links LS with building characteristics.[10]

In March 2013, a suspected outbreak of LS among children and workers of a day-care centre was reported to the Public Health Agency of Barcelona. The centre was located on the second floor of a new building opened in May 2011. In December 2012, a library in the same building was closed due to a possible outbreak of LS in adults. Both episodes created public alarm and caught media attention, as a result of which some families removed their children from the day-care centre.

As a public health authority, we were asked to investigate the possibility of a genuine outbreak of LS among children related to the building's characteristics. The specific objectives of our investigation were to confirm the presence or absence of a specific organic cause and to study the possibility of an epidemic somatoform disorder.

Patients and methods

Outbreak reporting and early investigation

On March 15th, 2013, a possible case of LS was reported to the Epidemiology Service of Public Health Agency of Barcelona. We organized a medical appointment with a paediatric dermatologist who confirmed the case on March 18th. Simultaneously, we visited the day-care centre to assess the building characteristics, and distributed an information leaflet to the families in order to detect other possible LS cases. On March 20th, a specialist company began an environmental study.

By April 15th, another case of LS in a child and two cases among day-care staff were detected. Consequently, other families removed their children from the day-care centre, which was eventually closed by the Department of Education. Several media published the news, and considerable public alarm was generated.

To detect LS in children and staff at the day-care centre, we carried out active case finding. In order to diagnose all LS cases among children, we organized appointments with the same paediatric dermatologist, and photographed all of them. The day-care staff members were also visited and photographed by the same occupational physician and dermatologist.

Epidemiologic investigation

Descriptive analysis

We performed a descriptive analysis in order to estimate the prevalence of this condition in both children and workers.

Definitions: The study population was composed of children (aged 6 months to 3 years) and staff at the day-care centre between September 2012 and April 2013. A case of LS was defined as any individual who was diagnosed with LS by a dermatologist or by an occupational physician. Where the study physicians disagreed, the individual was considered to be a possible case.

Study design: We photographed and performed a clinical evaluation of 86 children and 12 day-care staff. Some day-care staff were also evaluated by a non-recommended sonography study. We asked the families to complete an ad-hoc epidemiological questionnaire including children's body measurements (height, weight) and various exposure variables, including: length of time at the day-care centre, the use of tight clothes, presence of air conditioning at home and of devices that could cause repetitive trauma (baby carriage, high chair or other subjection devices). Day-care staff was asked about variables related to the school environment (air conditioning, furniture characteristics, and devices that could cause repetitive trauma).

Prevalence studies

We performed prevalence studies in the children (Study 1) and the staff (Study 2) to test for differences in the prevalence of LS between exposed and non-exposed to the day-care centre

For Study 1, we investigated children aged 1–3 years attending the day care centre under study and other day-care centres in the city between May and July, 2013. The subjects were recruited from the study population and randomly from registries for diseases of mandatory notification. We estimated a required sample size of 43, taking into account the observed prevalence among children of the day-care centre and the alpha risk (0.05) and beta risk (0.20). We finally recruited 41 children, all of whom were clinically evaluated by the same medical team.

For Study 2, non-exposed individuals were selected from sex and age (±2 years) matched day care staff and other workers