

PARACOCIDIOIDOMYCOSIS IN CHILDREN IN THE STATE OF RIO DE JANEIRO (BRAZIL). GEOGRAPHIC DISTRIBUTION AND THE STUDY OF A "RESERVAREA"

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SUMMARY

Thirty six cases of acute disseminated paracoccidioidomycosis in 3 to 12 year-old children, natives of the state of Rio de Janeiro, were seen in the period 1981-1996. All patients were residents in the rural region of 15 counties, scattered on the Southwestern part of this state.

The rural region of two neighboring counties, where 16 cases (44.4%) occurred, was visited. It exhibited the environmental conditions that are considered favorable to the survival of *P. brasiliensis*. The most important of these conditions, abundant watercourses and autochthonous forest, are distributed on well defined and limited areas, in which the dwellings are also localized.

Probably, a careful epidemiological study of forthcoming cases of the disease in children may facilitate the search for the micro-niche of the fungus.

KEYWORDS: Paracoccidioidomycosis; *Paracoccidioides brasiliensis*; Geographic distribution; Ecology.

INTRODUCTION

Paracoccidioidin skin test surveys, covering representative samples of rural population in the State of Rio de Janeiro, revealed that positive reactors have been found at less than four years of age⁸, and this may reach to 34.3% of the students 6 to 11 year of age¹². These results suggest that human being may contact *Paracoccidioides brasiliensis* at an early age. Reported cases of overt-disease that affected 3 year-old children confirm this assumption^{2, 11, 14, 15}.

Children of an early age usually develop their activities within a limited area around their houses. Consequently, they represent a good guide to localize the areas where *P. brasiliensis* survives in nature – the "reservareas"^{4, 6}.

"Reservarea" is a term coined by BORELLI³ to designate the places where the fungus lives and man acquires the infection. "Reservareas" have been delimited on the basis of data exhaustively obtained on the residential and occupational patterns of adult patients^{7, 10}, or patients at any age¹⁶. However, recently, CADAVID & RESTREPO⁴ used intradermal test with paracoccidioidin to delimit "reservareas" in a Colombian province, because a case of paracoccidioidomycosis (PCM) had occurred in a child in each one of the "reservareas".

The opportunity to review the clinical records of 36 cases of overt disease in 3 to 12 year-old native children, admitted to hospitals in Rio de Janeiro, led us to present this paper.

PATIENTS

Thirty six 3 to 12 year-old children with acute disseminated PCM were admitted to 3 hospitals of the city of Rio de Janeiro, during the period 1981-1996. All these patients were natives of and residents in the State of Rio de Janeiro.

Sixteen patients (9 males and 7 females) came from two neighboring counties: Barra Mansa and Volta Redonda. The remaining 20 patients came from others 13 counties. These counties were distributed on the Southwestern part of the state.

All patients lived in rural areas, but the exact localization of their homes was not recorded.

SELECTION OF STUDIED AREA

Two neighboring counties were selected for study – Barra Mansa and Volta Redonda – because nearly half of the 36 patients (16-44.4%) came from these counties. In addition, a survey with paracoccidioidin skin test had been carried out in Barra Mansa¹². This survey revealed the highest rate of

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positive reactors (60.6%) in a representative rural population in Brazil.

The two counties are located in the middle of the large Paraíba do Sul River Valley.

This valley lies between two chains of mountains, named Serra da Mantiqueira and Serra do Mar. The river flows northwestward to the Atlantic Ocean. Both counties together cover 784.6 km² and are crossed by the river. With the exception of a narrow plain along the border of the river, their topography is of a hilly upland. Along the numerous streams that flow into the Paraíba do Sul river, the region is dissected into a series of rolling hills. With a mean altitude of 380 m above the sea level, some hills may reach as much as 900 m at the foot hill of the Serra da Mantiqueira. The temperature ranges 8° to 40°C, with mean of 23°C; annual precipitation is from 1100 to 1300 mm³; average humidity hovers around 75%.

In the past, this region was covered by a semideciduous forest. With the introduction of the coffee monoculture, in 1883, a progressive deforestation was started. Only narrow strips, bordering the numerous streams, and few small areas covered by native forest were preserved. A few years later, in 1888, soil depletion led to gradual substitution of coffee plantations for pastures⁶. As a consequence cattle breeding, especially dairy cattle, is the main rural activity today. Crop production has been reduced to small areas of sugar cane for forage, vegetable gardening and fruit growing for local consumption.

In the rural region the houses in the small village and also the isolated dwellings have been built alongside the numerous streams that flow into the Paraíba do Sul river. Many small dams have been constructed for water retention or for the stream-crossing machines.

DISCUSSION

In 1976, PEDROSA¹² carried out a survey with paracoccidioidin skin test on a representative population of Barra Mansa. using FAVA NETO's paracoccidioidin diluted 1:80, he obtained the highest rate of positive reactors among the Brazilian rural population. PEDROSA selected this county because a case of acute disseminated PCM had been diagnosed in a native child. Probably, due to this reason, he also presented the results observed in 6 to 11 year-old native students (34.3%). In addition, impressed by the topography of the county, he tabulated the data obtained by testing children less than 11 years of age that lived in the districts of Barra Mansa. He obtained a rate of infected children varying from 25.2% in those living in the district at the level of the river Paraíba do Sul (altitude 380 m) up to 73.4% of those residents in a district situated on the foot hill of the Serra da Mantiqueira (altitude 900 m). Coincidentally, in the counties of Barra Mansa and neighboring Volta Redonda occurred the highest number of cases of overt disease in children.

As PCM affecting children is the result of the primary infection, latency period must be very short^{5,9}. In addition, children, especially at an early age, carry out their activities on limited area around their houses, and family migration is uncommon, they are the best guide to point out the true “reservarea”. One may presume that the niche where *P. brasiliensis* lives may be located near the patients' home. Some facts agree with this presumption: 1) the first conclusive isolation of the fungus, performed by ALBORNOZ¹, was from the soil of a hut in the thorp of Taica (Venezuela); 2) CADAVID & RESTREPO⁴ demonstrated that housekeeping activities are statistically associated with the infection by *P. brasiliensis* in a Colombian “reservarea”; and, 3) VERAS¹⁶ commented that children have limited areas of activities in which they can disturb the niche of the fungus.

RESTREPO¹³ and CADAVID & RESTREPO⁴ have called attention to the fact that, besides climatic conditions, the abundance of watercourses bordered by forest are the most important factors for supporting the *P. brasiliensis* micro-niche. In the counties of Barra Mansa and Volta Redonda there are numerous streams bordered by a narrow band of native vegetation, where are also located the villages and isolated houses. In this “reservarea” a through epidemiological study of forthcoming cases of overt disease in children can point out to those areas where the fungus can be more easily pursued.

RESUMO

Paracoccidioidomicose em crianças no Estado do Rio de Janeiro (Brasil). Distribuição geográfica e análise de uma “reservarea”

No período 1981-1996 foram observados 36 casos de paracoccidioidomicose aguda disseminada em crianças, entre 3 e 12 anos de idade, nativas do estado do Rio de Janeiro. Todos os pacientes residiam em região rural, distribuída por 15 municípios localizados na parte sudoeste do estado.

Dois municípios vizinhos, onde haviam ocorrido 16 (44,4%) dos casos, foram visitados. Na região rural de ambos, existem as condições climáticas e ambientais favoráveis à sobrevivência do *P. brasiliensis*. Dentre essas condições, as mais importantes, abundantes cursos de água e vegetação nativa, distribuem-se em áreas limitadas e bem definidas. Nessas áreas localizam-se, também, as casas dos rurícolas.

Provavelmente, um cuidadoso estudo epidemiológico de novos casos, que venham a ocorrer na região, facilitará a busca do nicho do fungo.

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