Mem. Inst. Butantan
35: 55-61, 1971.

EPIDEMIOLOGY OF HODGKIN'S DISEASE IN CHILDREN. A STUDY OF 36 CASES. *

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SUMMARY: The authors presents their findings with respect to the epidemiology of Hodgkin's disease in 36 cases of children coming from the South of Brazil, on the boundaries between the tropical and temperate zones.

They produce evidence that the peak incidence occurs, in their material, at age 5/6 years, and that there is another peak at age 9. They find the male/female ratio to be 4:1. They state that the highest incidence of its clinical onset is in Autumn. Significant peaks and falls were observed in other seasons.

These findings, compared with those reported by MacMahon, Innes and Newall, and Cridland, show that both in the Northern Hemisphere and in the Southern Hemisphere, the highest incidence of Hodgkin's disease in children occurs at the end of Autumn.

In the opinion of the authors their findings corroborate the hypothesis that Hodgkin's disease is an infectious disease.

UNITERMS: Hodgkin's disease; Epidemiology on neoplastic disease; Seasonal influence on neoplastic disease.

I. — INTRODUCTION

Epidemiological studies on Hodgkin's disease being made in the Northern Hemisphere by MacMahon (8), Fraumeni and Li (5), Cridland (3), Innes and Newal (6) and others, give support to old ideas about the nature and etiology of this disease. Further studies must be made in other parts of the world to obtain more statistical data and new observations. In this paper we intend to enlarge the comparative sector concerning the epidemiology of Hodgkin's disease and to provide statistics for the Southern Hemisphere, that is, cases of Hodgkin's disease observed in children in the south of Brazil on the boundaries between the tropical and temperate zones.

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* Study made in cooperation with the Department of Pathological Anatomy of the APCC Central Institute (Dr. A. Luisi, Director) and the Pathological Anatomy Section of the Butantan Institute, Pathology Division (Director Dr. Jesus Carlos Machado).

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Study made with assistence of the Butantan Institute Research Fund.

Adress
C. P. 65 — São Paulo, Brazil.

II. — MATERIAL

The data used in this study relate to 36 out of 46 cases of Hodgkin's disease recorded in the files of the Department of Pathological Anatomy of the APCC Central Institute (See Table 1). We disregarded ten cases because of lack of clinical data.

In all 36 cases the diagnosis was established by histopathological examination and reviewed by the author. The data given here were obtained from the clinical records of these patients on file at the AC Camargo Hospital.

III. — RESULTS

Table 1 shows the incidence of the cases by age, sex, and race. These data are being published separately, together with other observations on other types of malignant lymphomas. We see that in our material Hodgkin's disease affects children that are more than 4 years of age, there being only one child aged two years. The highest peak is betwen five and six years, and there is also another less pronounced, at age nine, after which the incidence of the disease diminishes. The frequency in males is much greater than in females reaching a ratio of 4:1. As expected, the highest incidence is among Caucasians and there is not a single case among Orientals and Negroes.

In Table 2, in addition to age, and sex, for the purpose of comparison we have listed associated diseases, whether or not related to Hodgkin's disease. Sometimes they are concurrent to the treatment. Thus we note that toxoplasmosis is associated with Hodgkin's disease in three cases, herpers zooster in two cases, and Kaposi Sarcoma in one, in addition to other which, in our opinion, are of less importance.

Figures 3 and 4 give the percentage data of the frequency according to the calendar month of the clinical onset of the disease. With respect to diagnosis we see that the months of highest incidence are January, February, March, July and September. Deaths occur more frequently in the months of January/February and June/July.

What is striking are the data relating to the clinical onset of the disease, that is, when the first signs or symptoms of it were observed. Figures 3 and 4 show that the highest percentage was characteristic of the months of May/June, that is, of Autumn in the Southern Hemisphere. It is also to be noted that, in all seasons, there is a rise and sudden fall of incidence.

IV. — DISCUSSION

When we compare the number of cases and the age with those presented by Fraumeni and Li (5), we see that in our material the peak incidence occurs at age 5/6, whereas for those authors its was age 9. We wish to point out that, surprisingly, after age 5-6 we also have a peak at age 9 with a subsequent decline until age 14, as occurs in the data of Fraumeni and Li (5). We believe that, in our country children are, perhaps, more exposed to infectious and parasitic agents, which would more actively excite the reticuloendothelial system and the lymphoid

tissue, thereby favoring the appearance of this incidence before age 9. In our cases the incidence in males exceeds the statistics of the above-mentioned authors. Whereas they found the ratio to be 3:1, we found it to be 4:1. For the purpose of comparison, we point out that our findings are similar to those of Junqueira Alvarenga (1) in children in the State of Minas Gerais, near São Paulo. The peak incidence occurs at age 6/7 and there is another similar peak at age 9, which subsequently declines. That author found the ratio betwen male and female incidence to be 3:1, lower than what we found. Now the data provided by Adonis de Carvalho (2) of Pernambuco, in Northeastern Brasil, are significantly different as far as incidence by sex is concerned. In his data we find a ratio of 1.5:1 (male/female). In his age table we find that the peak appears at age 6/7. We would need further data from different places before we could be certain that this variation is actually due to geographical differences, since Brazil is continental in size.

The most interesting verification relates to the variation according to seasons of the year. By plotting the clinical onset of the disease by frequency on a monthly graph, we find (Figures 1 and 2) that, in our material, the greatest frequency occurs in Autumn, and that in each season there is a peak and fall in incidence. If we construct a similar graph with the data obtained by J. F. Fraumeni and F. P. Li (5), we see that our observations coincide with those of the two above-mentioned authors. Thus we see that the highest peak is also in Autumn and there is a peak and fall in other seasons. The map shows the geographical origin of the patients, all of whom are from the south of Brazil, on the boundaries between the tropical and temperate zones.

V. — CONCLUSIONS

In addition to the conclusion which the authors (7) reached in collaboration with others namely that, among the malignant lymphomas and related diseases, excluding leukemias, Hodgkin's disease in children is the most frequent illness in Brazil, we can now add that the incidence by age in this more selected material, occurs at age 5/6, with a new peak at age 9. We believe, like Dalldorf (4), that perhaps in our country other agents can act in the direction of sensitizing the reticulo-endothelial system and inducing it more in the direction of Hodgkin's disease, in contrast to Africa, where the direction is towards Burkitt Lymphoma. With respect to sex, our male/female ratio is 4:1. The most interesting fact, in our opinion, is the influence of the seasons of the year. We observe that in our material the highest frequency of clinical onset occurs in the month of June, that is, at the end of Autumn. We note that the statistics from the Northern Hemisphere, that is, those of MacMahon (8), Innes and Newall (6), Cridland (3) also show that the highest incidence of clinical onset occurs in Autumn. Therefore, we can state that, according to our findings, Autumn is the season of the year in which the greatest number of cases of Hodgkin's disease occurs also in the Southern Hemisphere. These observations will facilitate further comparisons of speculations concerning the etiology of this disease.

MACHADO, J. C.; FRANCO DA SILVEIRA F.º, J. and RUSSO, A. D. — Epidemiology of Hodgkin's disease in children. A study of 36 cases. *Mem. Inst. Butantan,* **35**: 55-61, 1971.

RESUMO: Os autores apresentam seus achados sôbre a epidemiologia da Moléstia de Hodgkin em 36 casos de crianças procedentes do sul do Brasil, nas fronteiras entre as zonas temperadas e tropical.

Há evidência de que a máxima incidência ocorre no seu material entre os 5 e os 6 anos, havendo outro pico aos 9 anos. Verificaram ser a relação masculino/feminino 4:1. Observaram que a maior incidência do início clínico da afecção é no outono.

Êstes achados, comparados àqueles relatados por MacMahon, Innes e Newall, e Cridland mostram que nos dois hemisférios da Terra, Norte e Sul, a maior incidência da Moléstia de Hodgkin em crianças ocorre no fim do outono. Na opinião dos autores êstes achados auxiliam a hipótese de ser a Moléstia de Hodgkin possìvelmente afecção a virus.

UNITERMOS: Moléstia de Hodgkin; Epidemiologia de neoplasias; Influência sazonal nas neoplasias.

TABLE 1

TABLE 2

Case No.	*Sex*	*Age*	*Associated Diagnosis*
1	M	5	Toxoplasmosis, Herpes zooster
2	M	9	Anemia
3	M	13	—
4	M	9	—
5	M	9	—
6	M	8	Anemia
7	F	10	—
8	F	11	Malaria
9	M	10	Kaposi's Sarcoma
10	M	9	—
11	M	5	—
12	M	5	Taxoplasmosis
13	M	6	Anemia: multiple skin lesions
14	M	5	Herpes zooster
15	F	5	Anemia: multiple skin lesions
16	M	8	Toxemic shock due to pneumonia
17	F	13	Ulcers lesions of the skin; Sarcomatosis meningea; Cushing's syndrome; Amenorrhea due to radiotherapeutical castration; Deafness; Purpura due to dyscrasia; licken planus
18	M	12	Exulcerated skin lesions
19	M	5	Anemia
20	F	2	Aplasticanemia
21	M	6	Lichen planus — lichenoid urticaria
22	M	13	—
23	M	6	—
24	M	12	—
25	M	9	—
26	M	5	—
27	M	6	Nevus juvenil
28	M	8	Impetigo
29	M	11	—
30	M	6	—
31	M	6	Anemia
32	M	4	—
33	M	4	—
34	F	11	—
35	M	4	Nephritis due to iradiation — Toxoplasmosis
36	M	6	—

HODGKIN'S DISEASE IN CHILDREN

Seasonal influence

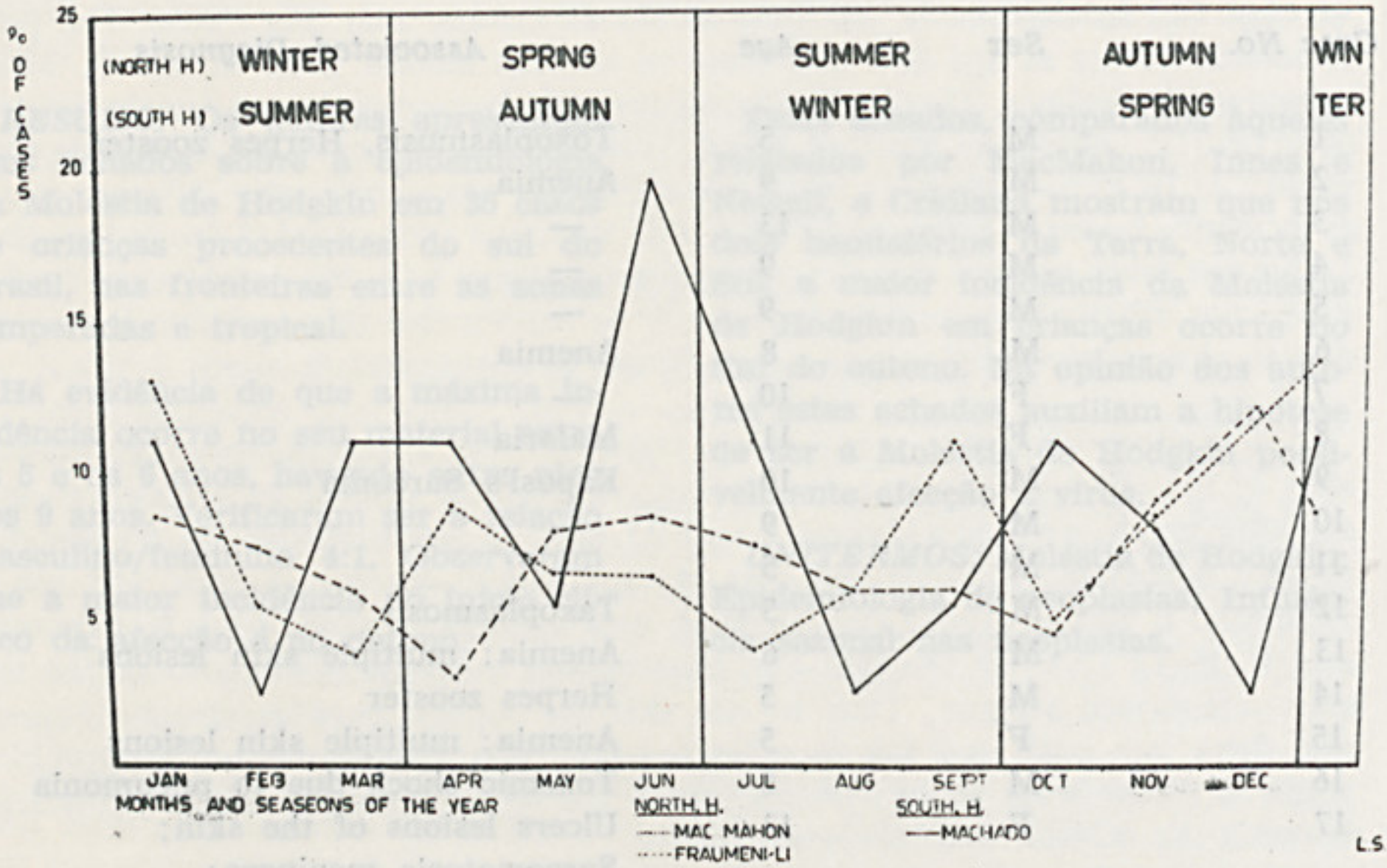

Fig. 3

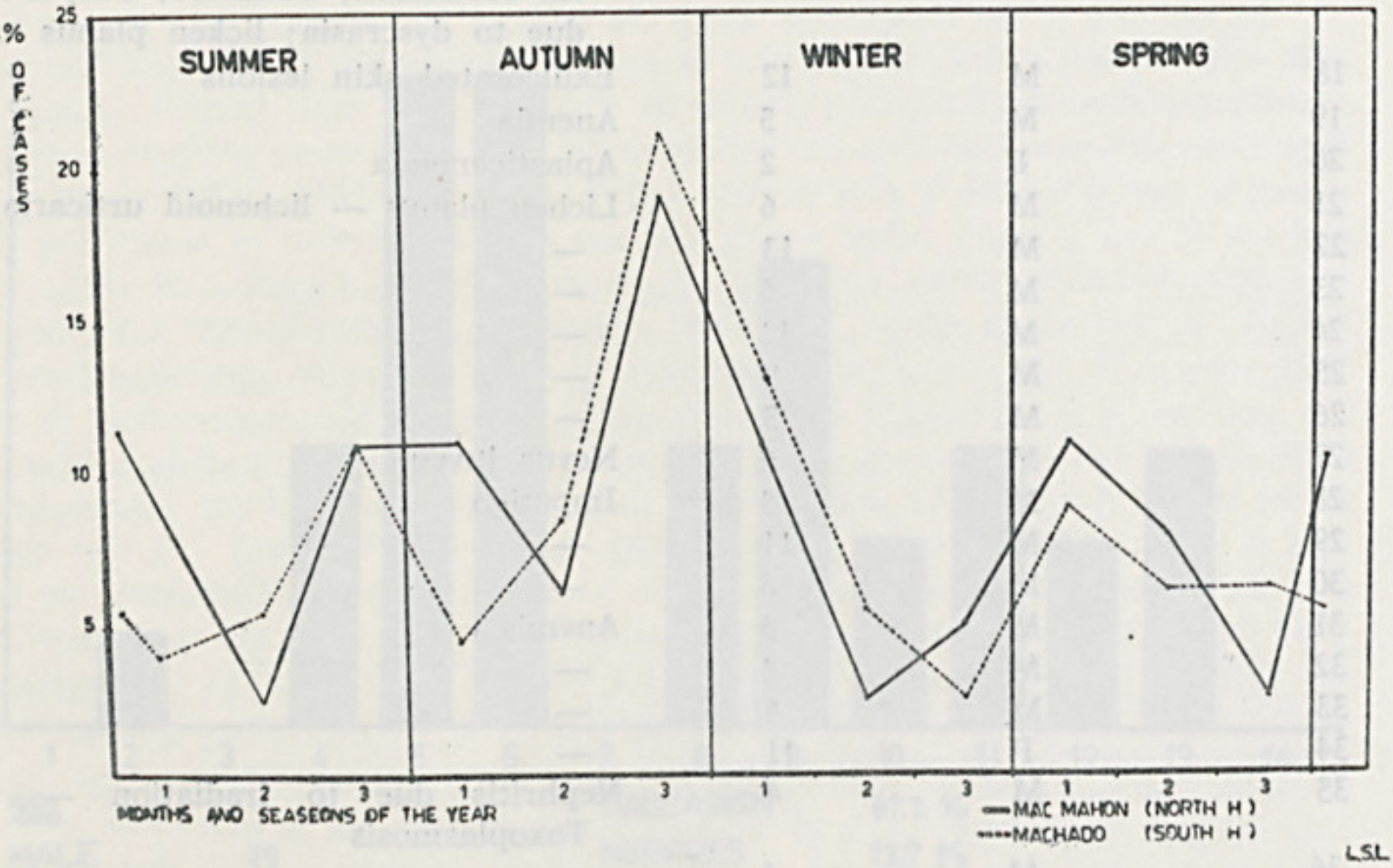

Fig. 4

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Recebido para publicação em 10 de agôsto de 1971

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