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SEASONAL VARIATION OF BIRTH DATES OF INFANTS WITH CONGENITAL DISLOCATION OF THE HIP

By

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Some years ago *Nagura* (1955) and *Pap* (1956) reported a considerable seasonal variation in the time of birth of infants with congenital dislocation of the hip in Japan and Hungary, respectively.

Of *Nagura's* series, 43 per cent of the 1306 newborns with congenital dislocation of the hip were born in December-February, the corresponding figures for *Pap's* series being 42 per cent of 217. Recently *Record & Edwards* (1958) described a series of 186 cases from Birmingham in which 35 per cent of the children were born in December-February.

In a series from Leipzig covering the years 1928-1957 and consisting of 4345 cases *Uibe* (1959) found a similar though less marked seasonal variation: in his series 28 per cent were born in December-February, but he did not take into consideration the normal seasonal variation of the total birth rate.

Pap reported that this seasonal variation was also found for children in whom the disease was diagnosed at birth, but he did not give the number of newborns on which he based this conclusion, and this number can hardly have been large, for his entire series consisted of only 217 cases. In the publications by the other above mentioned authors nothing is said about the newborns at all.

Since statistical data are available on the frequency of congenital dislocation of the hip covering the major part of Sweden (*Palmén* 1961) diagnosed partly at birth, partly later, it was considered worthwhile checking whether any seasonal variation could be demonstrated and, if so, whether there was any difference between the frequency curve of those cases diagnosed at birth and those diagnosed later, and whether the shape of the curve varied with sex.

MATERIAL

The material was divided into 3 series. Series A consisted of 1313 children (1118 females, 195 males) with dislocation of the hip treated at the departments of orthopaedics in Sweden during 1945 to 1960. These cases were not diagnosed at birth, but mostly after 1 year of age.

Series B was made up of 816 cases (661 female, 155 males) diagnosed at birth during the years 1953 to 1960.

Series C consisted of the boys in both groups (350 cases).

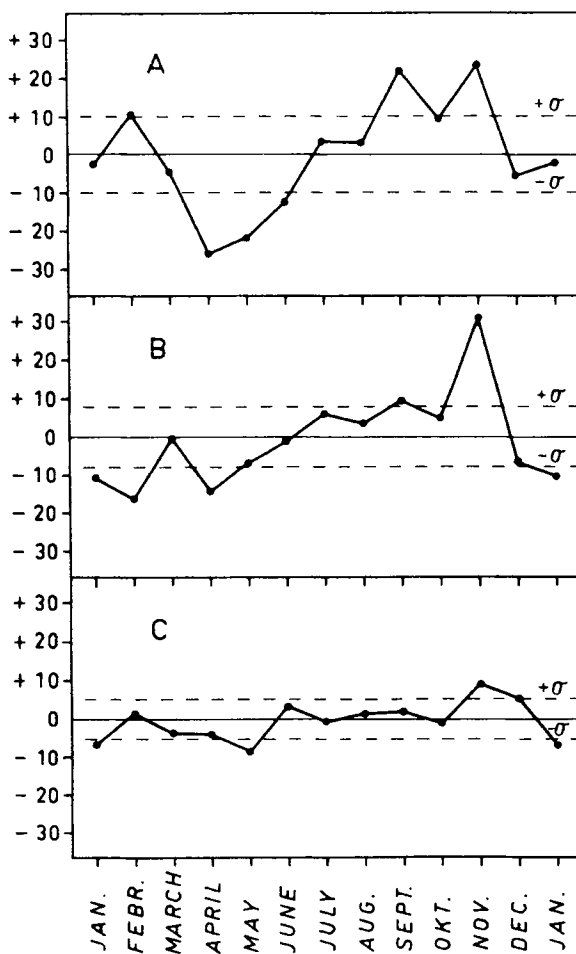


Fig. 1.

Graphic demonstration of differences between observed and expected values for the individual months of the year in the three series.

Random deviation calculated as $= \sqrt{n \times 1/12 \times 11/12}$

TABLE 1
Survey of observed and expected values for the months of the year in the three series

Series	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Okt.	Nov.	Dec.
A	Observed	106	117	118	97	100	99	113	107	127	114	95
	Expected	108.2	106.5	122.5	122.9	121.7	111.2	109.5	103.9	105.2	104.5	100.2
	Diff.	-2.2	+10.5	-4.5	-25.9	-21.7	-12.2	+3.5	+3.1	+21.8	+9.5	-5.2
B	Observed	57	50	76	62	69	68	74	68	75	70	56
	Expected	67.2	66.2	76.1	76.4	75.6	69.1	68.1	64.5	65.4	65.0	62.3
	Diff.	-10.2	-16.2	-0.1	-14.4	-6.6	-1.1	+6.1	+3.5	+9.6	+5.0	-6.3
C	Observed	22	30	29	29	24	33	29	29	31	27	35
	Expected	28.8	28.4	32.7	32.8	32.4	29.6	29.2	27.7	28.0	27.9	25.7
	Diff.	-6.8	+1.6	-3.7	-3.8	-8.4	+3.4	-0.2	+1.3	+2.0	-0.9	+9.3

A $\pm$ 10.0. B $\pm$ 7.9. C $\pm$ 5.2.

$\equiv$ 1313
 $\equiv$ 1312.8

$\equiv$ 816
 $\equiv$ 815.9

$\equiv$ 350
 $\equiv$ 349.9

RESULTS

The frequency curve for the patients according to date of birth thus showed a clear seasonal fluctuation with the crest of the wave in September-November and the trough in March-May, *i.e.* about 3 months earlier than in the other series referred to above. The shape of the curve for those cases diagnosed at birth was also the same as that for cases diagnosed later, usually after 1 year. The curve for the boys did not differ from that for the entire material.

DISCUSSION

Nagura ascribed this seasonal variation to differences in the heaviness of the clothing: in summer the children's clothing is lighter than in winter and therefore affords greater freedom of movement of the limbs, which facilitates spontaneous reduction of the dislocation. This view is shared by *Record & Edwards* (1958) who say: "The most likely explanation is that infants born in winter, particularly during cold weather, have to endure heavier clothing and cot coverings. This is likely to cause severe restriction of limb movements and prevent the thighs from assuming the natural position of flexion, abduction and external rotation, which is similar to the position adopted in the conventional treatment of the deformity".

This explanation is, however, less satisfactory because the frequency in those children in whom the disease was discovered at birth, *i.e.* before restriction of limb movements by clothing, showed the same seasonal variation. The difference in the heaviness of the clothing may, however, accentuate the existing seasonal variation.

It has been shown that dislocation of the hip is one of the manifestations of increased instability of the pelvis of the same nature as that in mothers during pregnancy and similar to that which can be induced in experimental animals by administration of oestrogen or relaxin (*Andrén* 1960). Evidence has also been produced to the effect that the breakdown of maternal and placental oestrogens and exogenous oestradiol is decreased in newborns with congenital dislocation of the hip (*Andrén & Borglin*, 1961).

These observations make it likely that it is the seasonal influences, climatic or alimentary, on the hormonal interrelationship that are responsible for the seasonal variation in the birth dates of infants with congenital dislocation of the hip.

SUMMARY

A seasonal variation of dates of birth of infants with congenital dislocation of the hip was found for 866 cases diagnosed at birth and 1736 cases diagnosed later. The variation was the same for both groups and for both sexes.

RESUME

Dans une série de 866 cas de dislocation congénitale de la hanche, constatée à la naissance, et de 1736 cas diagnostiqués plus tard, on a observé, par rapport aux dates de naissances des enfants une variation saisonnière qui est la même pour les deux groupes et les deux sexes.

ZUSAMMENFASSUNG

Eine an die Jahreszeit gebundene Variation der Geburtsdaten von Kindern mit kongenitaler Hüftverrenkung wurde bei 866 Fällen, die zur Zeit der Geburt diagnostiziert wurden und bei 1736 Fällen, die später erkannt wurden, gefunden.

Die Variation war die gleiche in beiden Gruppen und für beide Geschlechter.

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