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On Neonatal Twining in a Hospital of Dibrugarh, Assam

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ABSTRACT In an attempt to find out rate of twin birth in Dibrugarh, case records of Assam Medical College Hospital, Dibrugarh containing the information of 39,137 births for a period 1981–1994 were analyzed. The frequency of twin births is calculated in different communities and in different seasosns. Besides, effect of maternal age and birth order on twining is also exmained.

INTRODUCTION

Galton (1875) was the pioneer to point out the importance of the use of twins as a research tool for scientific purpose. Since then, similar such studies on twins have been reported from different parts of the world. It has been observed that twining frequency varies in different populations. This may be due to ethnic, fertility difference, climatic or nutritional variations. Population variation are found to be mainly due to variations in the dizygotic twining rate. Twining rate is highest in Africa. Dizygotic twining rate is considerably higher than monozygotic rate in Africa, while it is just reverse in Mongolian population of Far East. McArthur (1942, *c.f.* Gedda, 1961) associates higher twining rate and higher height of the people while Vallois (*c.f.* Bulmer, 1970) noted high twining rate in area of high B blood group frequency.

Surveying the literature on twin studies, especially on neonatal twins, it appears that very little work has been done on Indian population and especially from north eastern region, such studies are almost absent. Considering the dearth of data, an attempt has been made in the present study to investigate the frequency of twin births in different communities and in different seasons in a hospital of Dibrugarh, Assam. Besides, effect of maternal age and birth order on twining phenomenon is also studied.

MATERIAL AND METHODS

Information have been collected on the outcome of pregnancies for 14 years starting from January, 1981 to December, 1994. Available and well maintained birth registers of Assam Medical College, Dibrugarh were consulted. Relevant data on twins, multiple birth and single births were collected.

RESULTS AND DISCUSSION

Out of the total 39,137 birth during the fourteen year period, 38,645 are single, 487 twins and five triplets. Of the 974 twin babies, 484 are male and 490 female (161 male-male, 162 male-female, 164 female-female pairs). Since it is a hospital based study, no clear evidence of zygosity was obtained.

Twining Rate : The frequency of multiple birth in the present study is 1.253% (twin birth = 1. 24%; triplet = 0.013%) and the twining rate is calculated to be 12.44 per thousand. It merit to be mentioned here that low twining rate also noted by Ramamma and Mukherjee (1977) from Tirupati (1.08%); Guha (1982) and Roy Choudhury et al., (1985) from Calcutta (1.22% and 1.05%, respectively). Incidence of triplet birth like the present finding is also quite low in Calcutta (0.014%; Roy Choudhury et al., 1985) but in Tirupati (0.08%; Ramamma and Mukherjee, 1977) it shows comparatively higher incidence.

Nelson (1959; *c.f.* Ramamma and Mukherjee, 1977) reported that East Indians and Africans show higher incidence of multiple birth

as compared to Europeans and Mongoloids. In general, twining rate is considerably high in Africa, where it range from 44.9 to 53.2 per thousand confinements in Nigeria to nearly 17 per thousand in Congo and Zambia (Bulmer, 1960). Among the Negro population of U.S.A. twining rate was reported to be 15.8 per thousand (Enders and Stern, 1948). In Mongoloid population, twining rate is relatively low. In Japan and Singapore, it ranges from 4.3. to 7.7 per thousand maternities (Komai and Fukuoka, 1936; Morton, 1955 ; Kandron, 1961; Millis, 1959). However, in European population, twining rate is in between these two extremes, and it is on average 12.4 per thousand in European whites and 11.3 in American whites. In London and Aberdeen the highest frequency of twining rate is 16.6 per thousand (Karn and Penrose, 1951; Anderson, 1956).

Sarkar and Sarkar (1967) observed a decline in twining rate in India. A slight decline in the twining rate is also observed in the present study from 1981 to 1994. The decline seems to be due to its male-male pair which decreases from 7.25 per thousand in 1981, 5.71 per thousand in 1988 and 4.32 per thousand in 1994. On the other hand twining rate of female-female pair consistantly increased from 1.81 in 1981 to 4.32 in 1994 through 2.86 per thousand in 1988. However, male-female combination fluctuates between 4.53 in 1981, 3.14 in 1988 and 3.32 per thousand in 1994.

Twining Rate in Different Communities : Twining rates in different religious groups are presented in table 1. No distinct trend could be observed in the different religious communities. In the present study the Hindus show a very close resemblance to the Muslims in twining rate. Ideal sex ratio (1 :1) in twining is also maintained in both the religious groups. The present study, however, is at variance with Guha (1982) who reported higher twining rate among the Muslims of Calcutta. Barua (1977) attributed higher twining rate among the Indian Muslims due to higher inbreeding among them. In this context, it may be mentioned here that many of the Assamese Muslims are local converts and barring Sayeeds, rate of consanguinity among other Muslim groups are negligible. Interestingly, twining rate in Lahore (Pakisthan) is also found to be very high (it is 23.3 per thousand). Guha and Mukherjee (1990) also reported high twining rate (14.3 per thousand) among the Boro Kacharis of Assam which they attribute, due to the results of increased homozygosity.

Sex Ratio : In the present survey, total male births among the twins are 484 and female 490. Therefore, it can be concluded that the twin population, as expected, is maintaining the sex ratio (1:1), as seen in Poona (Guha, 1977) and Calcutta (Roy Choudhury et al., 1985) earlier. The ratio of male-male : female-female : male-female are 161 : 164 : 162 *i.e.,* approximately 1 : 1: 1. In winter female birth exceeds more than male births, however, the trend substantially decreases in autumn.

In the present study triplets are five in number. Of 15 babies, 5 are male and 10 female, sex ratio being 1 : 2.

Seasonal Variation : In the present series, incidence of single birth is highest during autumn (July-October), which is colsely followed by winter (November - February) and summer (March -June). However, this trend is not maintained in twining rate (Table 2). The present data although show low birth in summer but records highest incidence in autumn. Incidence of twining in winter is also appreciably highest. The present findings is in conformity with the results of Ramamma and Mukherjee (1977), Guha (1982), Roy Choudhury et al. (1985) who also noted highest twining rate in Autumn.

Effect of Maternal Age : No twining is reported in mothers in the age group above 45 years. It is apparent from table 3 that twining rate increases with maternal age upto 30

Table 1 : Twining rate in different religious groups

Groups	*Total births*		*Total twin pairs*							
			Total twin		*Male-Male*		*Male-Female*		*Female-Female*	
	No.	*%*	*No.*	*Rate**	*No.*	*Rate**	*No.*	*Rate**	*No.*	*Rate**
Hindu	36,923	94.34	461	12.49	153	4.14	153	4.14	155	4.20
Muslims	2,155	5.51	26	12.06	8	3.71	9	4.18	9	4.18
Others	59	0.15	-	-	-	-	-	-	-	-
Pooled	39,137	100.00	487	12.44	161	4.11	162	4.14	164	4.19

* rate per thousand

Table 2 : Relationship between twining rate and seasonal variation

Season	*Total birth*		*Total twin birth*			*Male-Male*		*Male-Female*		*Female-Female*	
	No.	*%*	*No.*	*%*	*Rate**	*No.*	*Rate**	*No.*	*Rate**	*No.*	*Rate**
Winter (Nov-Feb)	13,185	33.69	169	34.70	12.82	54	4.10	59	4.47	56	4.25
Summer (Mar-Jun)	11,247	28.74	141	28.95	12.54	47	4.18	47	4.18	47	4.18
Autumn (Jul-Oct)	14,705	37.57	177	36.34	12.03	60	4.08	56	3.81	61	4.15

* twining rae per 1000

Table 3 : Correlation between maternal age and twining rate

Age of mothers	*Frequency of Twining*							
	Total twin birth		*Male-Male*		*Male-Female*		*Female-Female*	
	No.	*Rate**	*No.*	*Rate**	*No.*	*Rate**	*No.*	*Rate**
11 - 15 yrs	1	0.03	-	-			1	0.03
16 - 20 yrs	34	0.87	11	0.28	9	0.23	14	0.36
21 - 25 yrs	155	3.96	51	1.30	50	1.28	54	1.38
26 - 30 yrs	201	5.14	69	1.76	64	1.64	68	1.74
31 - 35 yrs	76	1.94	26	0.66	27	0.69	23	0.59
36 - 40 yrs	19	0.49	4	0.10	12	0.31	3	0.08
41 - 45 yrs	1	0.03	-	-	-	-	1	0.03
All ages	487	12.44	161	4.11	162	4.14	164	4.19

* indicates twining rate per 1000.

Table 4 : Twining rate in different birth order

Birth order	*Total birth*		*Total twin birth*			*Male-Male*		*Male-Female*		*Female-Female*	
	No.	*%*	*No.*	*%*	*Rate**	*No.*	*Rate**	*No.*	*Rate**	*No.*	*Rate**
1	17,307	44.22	159	32.65	9.19	54	3.12	45	2.60	60	3.47
2	10,235	26.15	123	25.26	12.02	39	3.81	36	3.52	48	4.69
3	6,707	17.14	121	24.85	18.04	39	5.81	47	7.01	35	5.22
4	3,235	8.27	50	10.26	15.46	19	5.87	15	4.64	16	4.95
5	1,134	2.90	17	3.49	14.99	5	4.41	8	7.05	4	3.53
6	338	0.86	9	1.85	26.63	3	8.88	6	17.75	-	-
7	111	0.28	5	1.03	45.05	1	9.01	3	27.03	1	9.01
8	42	0.11	1	0.21	23.81	-	-	1	23.81	-	-
9	22	0.06	2	0.41	90.91	1	45.45	1	45.45	-	-
10	6	0.02	-	-	-	-	-	-	-	-	-

* Twining rate per thousand

years and thereafter drops abruptly. It is of interest that the mean maternal age of the twins in the present study appears to be rather low, in contrast with the existing hypothesis of high maternal age of twins.

Effects of Birth Order : It appears from table 4 that the sample under study shows gradual increase in twin birth rate as the birth order increases upto ninth. From the first birth order it gradually increases and remains steady in fourth and fifth then gradually goes on increasing wih a leap in the seventh and finally reaches the peak at ninth. It is also apparent from the table that the incidence of twining in the first three birth orders is less than the average rate of birth. From the fourth birth order it goes on increasing and the average rate of birth in these higher birth order is markedly less than the twining rate. The present finding is in conformity with Guha (1982), Roy Choudhury et al. (1985) who also noted gradual progress in incidence of twining with increasing birth order.

The present attempt has highlighted some very singnificant results as to an association between twining rate on one hand and each of maternal age, birth order, seasons on the other. This amply justify more research in the line in north east India to have clear idea about twining rate in different communities of the region and to confirm the present findings.

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