

ABO Blood Group Incompatibility and Consanguinity in Relation to Reproductive Performance: A Study Among Two Occupational Caste Groups of Andhra Pradesh

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ABSTRACT ABO blood group incompatibility and parental consanguinity on fertility and mortality in 117 Vadabaliya (Marine Fishermen) and 138 Yadava (Shepherds) of Andhra Pradesh reveal the positive effect of incompatibility causing an increase in the mean number of pregnancies; while the incompatibility and consanguinity together yield more number of post-natal deaths. Between the two castes, the Vadabalijas show lower values for all the variables studied than the Yadava, may be due to higher frequency of consanguinity and the traditional occupation of marine fishing of the former group.

The fitness of a population depends upon its reproductive success. As man lives in different ecological zones with varied occupations and socio-cultural practices, his perpetuation can be the resultant of bio-cultural interaction. Studies are available on the reproductive performance in relation to blood group incompatibility (Cohen and Sayre, 1968; Chakravarti and Chakravarti, 1977; Satyanarayana et al., 1978; Reddy and Reddy, 1980; and Reddy and Seshu, 1986) and consanguinity (Rao, 1976; Reddy and Rao, 1978; Reddy, 1979). The present paper for the first time, aimed to report the combined effect of both ABO incompatibility and consanguinity on fertility and mortality in two divergent occupational backward communities of Andhra Pradesh viz., the Vadabaliya and the Yadava. The former are marine fisher folk while the latter are shepherds. Both of them speak Telugu and are endogamous groups.

MATERIAL AND METHODS

Pregnancy data on 117 Vadabaliya and 138 Yadava women, who have completed four years of married life were collected from 18 villages of Visakhapatnam district by interview—schedule method during 1987. It being a retrospective study, much care was taken to obtain accurate information by cross-checking the data with elderly persons or old aged people of each family wherever possible. Blood samples were collected by finger prick method in normal saline from husband, wife and their available children aged above 3 years and they were analysed for ABO system after Race and Sanger (1962). There are 40 (34.19%) and 59 (42.75%) incompatible matings among the Vadabaliya and Yadava, respectively.

RESULTS AND DISCUSSION

Table 1 shows higher mean number of pregnancies, live births and living children among the incompatibility unions whereas compatible mat-

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Table 1: Mean values of reproductive performance in each mating type

Reproductive Performances	Vadabaliya (117)		Yadava (138)	
	Compatible	Incompatible	Compatible	Incompatible
	X $\pm$ S.E.	X $\pm$ S.E.	X $\pm$ S.E.	X $\pm$ S.E.
Pregnancies	3.99 $\pm$ 0.25	4.15 $\pm$ 0.26	4.99 $\pm$ 0.15	5.44 $\pm$ 0.20
Lives births	3.73 $\pm$ 0.24	4.00 $\pm$ 0.25	4.81 $\pm$ 0.15	5.41 $\pm$ 0.20
Living children	2.91 $\pm$ 0.18	3.53 $\pm$ 0.21	3.82 $\pm$ 0.12	4.48 $\pm$ 0.18
Child mortality (Post-natal deaths)	0.82 $\pm$ 0.13	0.66 $\pm$ 0.16	0.99 $\pm$ 0.10	0.93 $\pm$ 0.12
Abortions	0.05 $\pm$ 0.03	0.03 $\pm$ 0.02	0.05 $\pm$ 0.02	0.00 $\pm$ 0.00
Still births	0.21 $\pm$ 0.05	0.13 $\pm$ 0.06	0.14 $\pm$ 0.04	0.05 $\pm$ 0.02

N.B.: None of the 't' values yield significant differences (Except for the living children in the Yadava).

Table 3: Segregation of ABO blood groups

Mating Type	Vadabliya Children						Yadava Children					
	No. of Matings	O	A	B	AB	Total	No. of Matings	O	A	B	AB	Total
COMPATIBLE												
O X O	25	39				39	22	34				34
A X O	8	5	8			13	15	18	5			23
AB X O	3			3		3	6		4	4		8
B X O	19	7		16		23	15	13		11		24
A X A	2	1	2			3	4	3	7			10
B X B	19	10		15		25	9	4		15		19
AB X A	0						1			2		2
AB X B	0						5		3	4	2	9
AB X AB	1		1			1	2		1			1
Total	77	62	11	34		107	79	72	20	36	2	130
INCOMPATIBLE												
O X A	6	6	5	0	0	11	8	13	10	0	0	23
O X B	13	11	0	10	0	21	21	15	0	11	0	26
O X AB	6	0	4	4	0	8	2	0	4	3	0	7
A X B	8	0	3	4	3	10	10	4	3	6	1	14
B X A	5	1	2	3	1	7	12	2	4	6	6	18
A X AB	0	0	0	0	0	0	3	0	2	3	2	7
B X AB	2	0	2	0	1	3	3	0	1	10	1	12
Total	40	18	16	21	5	60	59	34	24	39	10	107
Grand Total	117	80	27	55	5	167	138	106	44	75	12	237

Table 2: Fertility and mortality trend among the incompatible and consanguineous unions

Yadava (138)												Vadabaliya (117)														
Mating Type	Total No. of matings			Total pregnancies			Total live children			Prenatal deaths			Post-natal deaths			Total pregnancy wastage										
	Total No. of matings			Total pregnancies			Total live children			Prenatal deaths			Post-natal deaths			Total pregnancy wastage										
	C	NC	C	C	NC	C	C	NC	C	C	NC	C	C	NC	C	C	NC	C								
COMPATIBLE																										
O X O	3	22	21	77	20	44	0	77	1	77	1	15	13	15	4	18	25	78	23	77	3	1	3	19	6	20
A X O	0	8	0	44	0	67	0	67	0	40	1	3	0	3	1	12	18	59	18	57	0	2	8	14	8	16
B X O	2	17	18	72	18	12	0	12	3	67	0	5	9	13	9	11	20	63	19	65	1	3	6	8	7	11
A B X O	0	3	3	12	0	9	6	9	0	12	3	0	0	4	3	5	5	20	5	20	0	0	1	1	1	1
A X A	1	1	6	43	0	36	0	36	0	7	0	5	0	2	0	4	0	24	0	23	0	1	0	5	0	6
B X B	0	19	0	2	0	2	0	2	0	36	0	7	0	5	0	12	1	35	6	32	0	3	1	6	1	9
A B X A B	0	1	0	2	0	2	0	2	0	2	0	0	0	0	0	2	0	8	0	8	0	0	0	2	0	2
A B X A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	5	0	5	0	0	0	1	0	1
A B X B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	23	0	22	0	1	0	3	0	4
Total	6	71	48	259	44	243	5	243	5	15	23	40	28	55	13	66	74	320	71	309	4	11	19	59	23	70
INCOMPATIBLE																										
O X A	0	6	0	20	0	19	0	19	0	1	0	2	0	2	0	3	3	29	22	28	0	1	8	2	8	3
O X B	2	11	16	55	16	52	0	52	0	3	2	2	2	2	2	16	31	80	31	79	0	1	8	13	8	14
O X A B	0	6	0	15	0	14	0	14	0	1	0	0	0	0	0	2	0	8	0	8	0	0	0	1	0	1
A X B	3	5	18	10	18	10	0	10	0	0	5	1	5	1	5	10	0	52	0	52	0	1	0	11	0	12
B X A	0	5	0	24	0	24	0	24	0	0	0	7	0	7	0	10	14	49	14	49	0	0	0	4	0	4
A X A B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	18	0	18	0	0	0	2	0	2
B X A B	0	2	0	8	0	7	0	7	0	1	0	0	0	0	0	3	0	18	0	18	0	0	0	6	0	6
Total	5	35	34	132	34	126	0	126	0	6	7	12	7	18	10	49	67	254	67	252	0	3	16	39	16	42
Grand Total	11	106	82	391	78	369	5	369	5	21	30	52	35	73	23	115	141	574	138	561	4	14	35	98	39	112

ings possess higher mean values for the child mortality, still births and abortions in both the castes. Thus, the expected positive effect of materno—foetal incompatibility is only observed with an increase of fertility component to overcome the loss due to incompatibility. In contrast, the study of Reddy and Seshu (1986) reveals that incompatibility has negative effect on fertility and positive effect on mortality in a small inbred caste, Pattusali of Chittoor District of Andhra Pradesh. Surprisingly the data indicates higher values for all the variables studied, among the Yadava than Vadabali pointing the possible role of ecology when viewed from the point of their traditional occupations. Moreover, slightly high frequency of consanguinity (Rajeswari, 1988) among the Vadabali (36%) than the Yadava (33%) can also be presumed causing such differential reproductive performance.

From the reproductive performance of couples, who were both consanguineous and incompatible for ABO blood group (Table 2), it is evident that the mating type OxB and AxB relatively show high frequencies of post-natal deaths in the consanguineous group.

The segregation analysis of ABO blood groups in children (Table 3) also observed that selection is acting against blood group 'A' in matings of blood group 'O' involved compatible matings and against both blood groups 'A' and 'B' in the incompatible matings. When total matings are considered in each category, selection is towards blood group 'B' in the compatible and 'O' in the incompatible.

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