CHANGING PATTERN OF Rh (D) IMMUNISATION IN BOMBAY

by

SNEHALATA C. GUPTE,* M.Sc., Ph.D.

and

H. M. BHATIA,** M.Sc., Ph.D.

Introduction

The first report on Rh immunisation from India was probably by Sanghvi and Khanolkar (1947). Subsequent reports were published by Garde and Bhatia (1954) and Bhatia and Sanghvi (1959), thus signifying the importance of Rh(D) immunisation in Indian population. Based on these reports, first Rh antenatal clinic was established at Nowrosjee Wadia Maternity Hospital, Bombay in 1957, by Blood Group Reference Centre (I.C.M.R.), now known as Institute of Immunohaematology. Since then nearly 10,000 women are being investigated at this unit every year.

The maternal isoimmunisation is a result of foetal red cell leak into the maternal circulation occurring mainly at the time of delivery. The maternal isoimmunisation to Rh therefore occurs rarely during first pregnancy and increases with increasing parity. It is also well established that ABO incompatible pregnancy protects the mother against Rh immunisation (Levine, 1943). Prevention of maternal immunisation to Rh is achieved by injection of Rh anti-immunoglobulin immediately after Rh(D) positive delivery (Woodrow, 1970). Routine use of such prophylaxis in the Western countries has virtually eliminated Rh(D) haemolytic disease of the newborn (HDN) (Gustafson, 1982). In India, the prophylactic anti Rh IgG is increasingly used since 1972 and at present more than 50% Rh(D) negative women are protected by this procedure. In the present communication large data is analysed to assess the significance of large scale use of anti-Rh IgG and other factor on the maternal iso-immunisation.

*Research Officer, *Institute of Immunohaematology, Nowrosjee Wadia Maternity Hospital, Bombay-400 012.*

**Director, *Institute of Immunohaematology, Seth G.S. Medical College, Bombay-400 012.*

Correspondence and Reprint Request:
Dr. H. M. Bhatia,
Director,
Institute of Immunohaematology,
Seth G.S. Medical College,
Bombay-400 012.

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Material and Methods

ABO and Rh(D) grouping is routinely done for every pregnant woman at Nowrosjee Wadia Maternity Hospital I.I.H. unit. Rh(D) negative women are investigated for Rh(D) antibodies and followed up till delivery. Rh(D) antibody titre levels are done using enzyme or indirect antiglobulin techniques (Bhatia, 1972). At birth, cord blood samples are collected and investigated for ABO and Rh(D) group, direct antiglobulin test, Hb and serum bilirubin. Prophylactic dose of anti-Rh IgG is advised to every Rh(D) negative nonimmunised mother with Rh(D) positive child. Generally 250

μg dose is administered for normal and 350 μg for complicated delivery cases.

Data collected from 1969 to 1980 was analysed for the present communication.

Results

Table I gives the incidence of Rh(D) immunisation from 1969 to 1980. Though the number of Rh(D) negative women attending our antenatal clinic have increased significantly during 1978-80 the incidence of Rh(D) immunisation has decreased during the same period.

Since the maternal isoimmunisation is influenced by Rh(D) negative or ABO incompatible pregnancy, the present data was further analysed to see if the decreased incidence of immunisation during 1978-80 was due to change in these factors. Findings in Table II suggest that incidence of Rh(D) negative and ABO incompatible pregnancies has been comparable during 1969-1980. Table II also gives very low incidence of Rh(D) negative as well as ABO incompatible pregnancies in Rh(D) immunised series.

TABLE I

Incidence of Rh (D) Immunisation From 1969-1980

Year	No. of women tested	Total No. of Rh (D) Negs.	No. of Rh (D) immunised women	Incidence of Rh (D) immunisation
1969-71	30331	1497 (4.7)	43*	1:23
1972-74	27509	1171 (4.3)	57	1:21
1975-77	25509	1331 (5.2)	60	1:22
1978-80	28407	1678 (5.9)**	51	1:33**

Figures in the ( ) indicate percentage values.
* During 1969-71 only 977 Rh negative women were tested for Rh (D) antibodies.
** Statistically significant increase <0.005.

TABLE II

ABO Incompatibility and Rs (D) Status of Infants Born to Rh (D) Negative Immunised and Non-immunised Women

Year	No. of mothers delivered	Number of infants born		
		Rh (D) Neg.	Rh (D) +ve	ABO Incom. Rh (D) +ve
1969-71	734	172 (23.4)	562	173 (30.7)
1972-74	484	101 (20.1)	383	111 (29.0)
1975-77	609	136 (22.3)	473	124 (26.2)
1978-80	1041	233 (22.4)	808	210 (26.0)
Total	2868	642 (22.4)	2226	618 (27.8)
Rh (D) Immunised	181	11 (6.1)*	170	23 (13.5)*

Note: 1. Figures in the ( ) indicate percentage values.
2. Considering 5% Rh (D) negative in the population, incidence of Rh (D) negative child to Rh (D) mother is 22.6%.
* Statistically significant decrease $p<0.01$.

Table III gives the parity distribution of the Rh(D) negative women attending antenatal clinic. There is a significant increase in the primigravida and decrease in multiparous women during 1975-1980. Average number of pregnancies have also reduced during the period. However, the parity distribution of immunised cases does show only a marginal nonsignificant change.

TABLE III

Parity Distribution of Rs (D) Negative Non-immunised (NI) and Immunised (I) Women During 1969-80

Series	Year	Total cases	Parity				
			I	II	III	IV	>IV
NI	1969-74	2508	663 (26.4)	717 (28.6)	545 (21.7)	288 (11.5)	295 (11.8)
	1975-80	2898	1047* (36.1)	871 (30.1)	581 (20.1)	252 (8.7)	137* (4.7)
I	1969-74	100	0 (0)	15 (15)	23 (23)	21 (21)	41 (41.0)
	1975-80	111	2 (1.8)	23 (20.7)	20 (18.0)	28 (25.2)	38 (34.2)

Figures in the ( ) indicate percentage values.
* Statistically significant increase or decrease.

Discussion

Discovery of anti-D immunoglobulin injection is the major landmark in the virtual elimination of Rh(D) HDN in many countries (Gustafson, 1982). In Bombay, the increasing use of this therapy in recent years has shown the significant reduction in the incidence of Rh(D) immunisation, since 1978. This change in the immunisation rate is not a result of increase in Rh(D) negative or ABO incompatible pregnancies in the non-immunised women during the same period Parity distribution of non-immunised women shows significant increase of the women with first pregnancy in recent years. This would certainly influence the maternal immunisation since immunised women are significantly more among multiparous women. This changing pattern of parity distribution is evidently a result of popularity of family planning programme. Thus the decreased incidence of Rh(D) immunisation as observed in our data is a result of not only the use of prophylactic anti-Rh IgG, but also the tendency to have less number of pregnancies. In U.S.A. 99 per cent implimentation of anti-Rh IgG prophylaxis has brought about the virtual elimination of Rh(D)-HDN in 10 to 12 years period (Jenning, 1976). It would be impossible to have such a success in India where the large number of Rh(D) negative women cannot afford such a therapy unless it is supported by hospital authorities in such deserving cases.

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Summary

To study the impact of anti-D immunoglobulins prophylaxis and other factors on the incidence of Rh (D) immunization, data collected from 1969-80 at Nowrosjee Wadia Maternity Hospital was analysed. Significant reduction in the incidence of Rh (D) immunization was observed during 1978-80, compared to earlier years. This decreased incidence was due to (1) Frequent use of anti-D immunoglobulin injections. (2) Popularity of family planning programme.

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