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Research Article

### ASSESSMENT OF AWARENESS OF SAUDI FEMALE ABOUT COMPLICATION OF RHESUS FACTOR (RH) INCOMPATIBILITY DURING PREGNANCY IN TAIF CITY, SAUDI ARABIA

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**Abstract:**

**Introduction:** Rhesus (Rh) incompatibility is associated with the development of maternal Rh sensitization and hemolytic disease of the neonate (HDN). Studies have shown that mothers had a low level of knowledge about Rh incompatibility and its complications. The aim of this study was to assess the RH incompatibility awareness and its relation to pregnancy among Saudi females in the Taif city of Saudi Arabia. **Methodology:** The awareness about Rh incompatibility during pregnancy and its complications among Saudi females from Taif city were studied using an online questionnaire. The study included 224 Rh-negative females with age ranging from 18-22 year that was done from October 2019 to April 2020. **Results:** all participants knew their blood group, 39.7% knew about RH incompatibility, 64.7% reported that RH incompatibility leads to abortion or early labor. Of them, 84.8% said that negative blood groups need close follow up during pregnancy, 55.4% knew that negative Rh affect baby condition after delivery, and 72.8% knew that Rh incompatibility needs more care during pregnancy. Most of the participants (89.3%) reported that injection is given both before and after delivery. **Conclusion:** The defective knowledge regarding some aspects related to RH incompatibility necessitates a health education campaigns directed to all females. The health care professional should direct a health education message regarding this issue to their female clients, especially pregnant females.

**Keywords:** Rh incompatibility, anti- D immunoglobulin, Saudi female

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**INTRODUCTION:**

Rhesus (Rh) factor is an inherited protein found on the surface of red blood cells. If the blood has this protein, it will be Rh-positive, while if it lacks it, it will be Rh-negative. Rh incompatibility is a condition that develops when a pregnant woman has Rh-negative blood, and the baby in her womb has Rh-positive blood [1]. Having an Rh-negative blood type is not an illness and usually does not affect the health state. However, during pregnancy and the mother is being Rh-negative, and the baby is Rh-positive, there's a potential for the maternal body to produce antibodies that could be harmful during pregnancy [1]. Firstborn infants are often not affected unless the mother had past miscarriages or abortions. If the mother gets pregnant again with an Rh-positive baby, the antibodies already in her blood could attack the baby's RBCs. This can cause the baby to have anemia, jaundice, or more serious problems. [2].

If Rh antibodies cross the placenta to the fetus, some of the red blood cells (RBCs) of the fetus may be destroyed, leading to anemia. This damage is called fetal (erythroblastosis fetalis) or hemolytic disease of the neonate (HDN) which occurs due to incompatibility between fetal and maternal blood group [2,3]. A yellow pigment named bilirubin is produced when RBCs are destroyed causing jaundice, and in severe cases the brain may be damaged (kernicterus) and severe anemia can result in the fetus's death [1,2].

The clinical picture of HDN includes lethargy, pallor, jaundice, scleral icterus, tachycardia, tachypnea, and hypotension. Hydrops fetalis is severe, life-threatening hemolytic anemia and is associated with a significant mortality rate estimated to be more than 50% [4,5].

The incidence of Rh disease in a population depends on the predominance of Rh-negative, and it was found that about 15% of the white population has an RhD negative blood type. Previous studies reported that the incidence of RhD negativity is highest among Basques (36%), less than 1% of the Native American and Asian populations have this phenotype [6].

The frequency of Rh-negative is more common in Caucasian women (15%) than African American (5%) and is less common in Asian women [7].

A cross-sectional study done in Turkey has found that 79.9% of the participants heard about Rh incompatibility, and 12.64% didn't have any information on whether they had Rh incompatibility in their own pregnancies or not [8].

In the kingdom of Saudi Arabia (KSA), a study was done by Bondagji in 2011, which included 24005 pregnant women from Jeddah city. This study aimed to determine the distribution of ABO blood group and Rh factor among pregnant women, and the study estimate the prevalence of Rh alloimmunization. The study found that the most common blood group was O, followed by A, B, and AB positive. Rhesus negativity blood group was reported in 7.5%. Four hundred and twenty-four cases were reported as Rh antibody positive with a prevalence of alloimmunization of 1.8% in the studied population, and 23.6% among Rh-negative women [9].

Another cross-sectional study was done in KSA in Arar in 2017 and included 343 antenatal cases. The study aimed to determine the prevalence of Rh incompatibility, mothers' knowledge about Rh incompatibility, mothers' knowledge about anti-D immunoglobulin, and to show the pregnancy outcome of Rh-negative mothers. In this study, 3% of the studied mothers were Rh-negative, only 38% had knowledge about Rh incompatibility, 68.5% had knowledge about anti-D, and 51% had knowledge about the time of administration of anti-D. The study recommended that Health education sittings are needed to increase public awareness about Rh incompatibility [4]. The prevalence of the Rh-negative blood group in the Eastern region of Saudi Arabia is 8%, and in Southwest, Saudi Arabia is 7.2% [10,11].

A careful literature search has found the studies that assessed Rh incompatibility knowledge and the pregnancy outcome of Rh-negative mothers in Saudi Arabia are lacking. The aim of this study was to determine the awareness among Saudi females about RH incompatibility and relation to pregnancy in the Taif city of Saudi Arabia.

**SUBJECTS AND METHODS:**

A Descriptive cross-sectional study was conducted in the period from 1 October 2019 to 6 April 2020. The study population was Saudi females who live in Taif city, Saudi Arabia. Data were collected from 224 Rh negative participants, whether pregnant or not, with age ranging from 18-55 years and excluding non-Saudi females and those females with an age of more than 55 and less than 18 years. The data was collected by using an electronic questionnaire, which was obtained from a previous Saudi study done in Arar city [6]. The questionnaire was modified by authors as the questionnaire items related to the father were omitted. The questionnaire was distributed to females through social media.

The 1<sup>st</sup> section of the questionnaire included Socio-demographic data of the participants (age, educational status, marital status, and consanguinity). The 2<sup>nd</sup> section included items about

the blood groups and Rh factor. The 3<sup>rd</sup> part included questions regarding women's awareness of Rh incompatibility during pregnancy and its complications.

**Data analysis:** Data was translated from Arabic to English and analyzed by using the Statistical Package for the Social Sciences (SPSS) version 23. We applied numbers and percents for categorical data and means SD for numerical data. Chi-square tests also applied for comparison between categorical variables and their awareness. A p-value of less than 0.05 was considered significant,

### RESULTS:

(Table 1) shows the demographic data of the studied female, 30.8 % of participants had an age ranging from 36-45 years. 96% were highly educated, 75% were married; of them, 30% were married to a relative.

Only 9% of the sample were pregnant ladies. All the participant knew their blood group; of them, 42% were O – as the most common blood group in studied participants, and the AB blood group was the least common with a prevalence of around 7% (Figure 1). Around two-thirds of females do not know about Rh incompatibility (Figure 2).

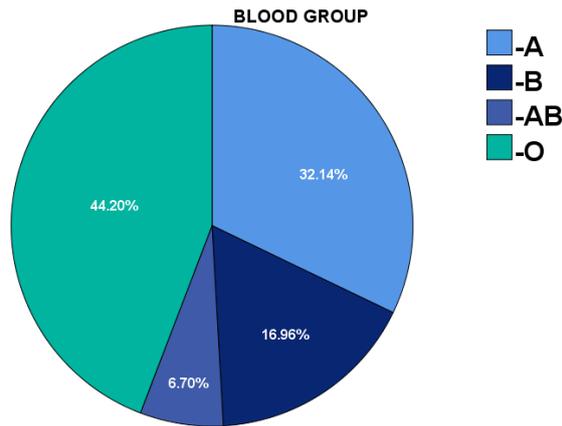
(Table 2) illustrates the female knowledge about Rh incompatibility among different ages, educational levels, marital status, pregnant condition, consanguinity, and blood group. The highest

knowledge of the Rh incompatibility was among highly educated females who were 97.8 % without a significant difference in knowledge among different educational levels. 71.9% of married females had knowledge about Rh incompatibility, 70% of non-pregnant ladies had knowledge about it. Among blood groups, 43.8% of the -O type had knowledge. A non- significant relationship was found between the participants' knowledge and their age, education level, marital status, pregnancy, consanguinity, or blood group ( $p > 0.05$ ).

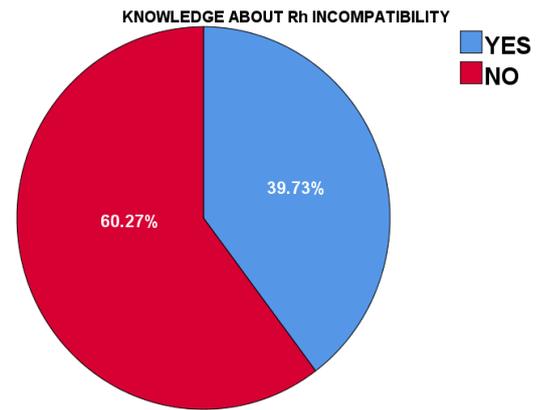
According to the overall knowledge of females of the general principles of Rh incompatibility and negative Rh, (Table 3) shows that 39.7% of studied females knew RH incompatibility, 64.7% reported that RH incompatibility leads to abortion or early labor, 84.8% said that negative blood group needs close follow up during pregnancy, 55.4% reported that negative Rh affect baby condition after delivery, and 72.8% mentioned that Rh incompatibility needs more care during pregnancy. The highest percentage of questions answered yes was for the question about the negative impact of the negative blood grouping during pregnancy ( $> 80%$ ), the highest percentage of questions not known by the studied were about knowledge about the death of the first baby if the mother is untreated Rh-negative and about the injection around delivery. About 64.7% of them knew the RH incompatibility leads to abortion or early labor. 10.7% said there are injections given to the mother of Rh -ve blood group 7% of them mentioned it's given after delivered the baby.

**Table 1. The age group of the mother, educational level, marital status, pregnancy and consanguinity between parents among the studied females, Taif, KSA (n= 224)**

Variables		n	%
Age of mothers (year)	18-25	59	26.3
	26-35	61	27.2
	36-45	69	30.8
	46-55	35	15.6
Educational level	Non-educated	2	0.9
	Low educated	7	7
	High educated	215	96.0
Marital status	Married	170	75.9
	Not married	54	24.1
Consanguinity	Not married	37	16.5
	Yes	66	29.5
	No	121	54.0
Pregnant	Pregnant	20	8.9
	Non-Pregnant	204	91.1



**Figure 1. distribution of the studied mother's blood groups and Rh**



**Figure 2. knowledge distribution about Rh incompatibility**

**Table 2. knowledge of female about Rh incompatibility, educational level, marital status, and blood group among the studied female (n= 224)**

Parameters		Knowledge		Chi-Square	p-value
		Yes (%)	NO (%)		
Age	18-25 ( n= 59 )	29 (32.6)	30 (22.2)	4.94	1.76
	26-35 ( n= 61 )	19 (21.3)	42 (31.1)		
	36-45 ( n= 69 )	25 (28.1)	44 (32.6)		
	46-55 ( n= 35 )	16 (18.0)	19 (14.1)		
Education level	Non educated ( n= 2 )	0 (0.0)	2 (1.5)	1.731	0.421
	Low educated ( n= 7 )	2 (2.2)	5 (3.7)		
	High educated ( n= 215 )	87 (97.8)	128(94.8)		
Marital status	Married ( n= 170 )	64 (71.9)	106 (78.5)	1.280	0.258
	Not married ( n= 54 )	25(28.1)	29 (21.5)		
Pregnant	Pregnant ( n= 20 )	3 (3.4)	17 (12.6)	6.019	0.049
	Non pregnant ( n= 204 )	86 (96.7)	118 (87.4)		
Consanguinity	Not married ( n= 37 )	19 (21.3)	18 (13.3)	3.21	0.2
	Yes ( n= 66 )	22 (24.7)	44 (32.6)		
	No ( n= 121 )	48 (53.9)	73 (54.1)		
Blood group	-A ( n= 72 )	27(30.3)	45 (33.3)	1.336	0.721
	-B ( n= 38 )	18 (20.2)	20 (14.8)		
	-AB ( n= 15 )	5 (5.6)	10 (7.4)		
	-O ( n= 99 )	39 (43.8)	60 (44.4)		

**Table 3. Female knowledge about Rh incompatibility and Rh-negative (n= 224)**

Knowledge	Yes (%)	No (%)	Total (%)	
RH incompatibility lead to abortion or early labor	145 (64.7)	79 (35.3)	224 (100)	
Negative blood group need close follow up during pregnancy	190 (84.8)	34 (15.2)	224 (100)	
Negative Rh affect baby condition after delivery	124 (55.4)	100 (44.6)	224 (100)	
Rh incompatibility leads to the death of the first baby	39 (17.4)	185 (82.6)	224 (100)	
Rh incompatibility need more care during pregnancy	163 (72.8)	61(27.2)	224 (100)	
Injection is given to the mother of Rh –ve blood	24 (10.7)	200 (89.3)	224 (100)	
Affection of Rh incompatibility is preventable	62 (27.7)	162 (72.3)	224 (100)	
Injection is given before delivery or after delivery	before	after	both	Total
	8 (3.6)	16 (7.1)	200 (89.3)	224 (100)

**DISCUSSION:**

In the present study, all participants knew their blood group, a result that is better than that observed in a previous study done in Turkey, where 39.3% of the participants didn't know about their own blood group [12]. 39.7% of the participants in the study had reported their knowledge about RH incompatibility, 64.7% reported that RH incompatibility leads to abortion or early labor. This result is consistent with that observed in the previous Saudi study done in Arar city, which found that only 38% of the studied mothers had knowledge about Rh incompatibility [6].

This result also agrees with that observed in a study done in Nigeria and showed that the level of knowledge of maternal-fetal blood incompatibility of the expectant mothers was low, and only 56% had a positive attitude [13].

A much lower percent was found in a previous study done in Pakistan, where only 2% of studied women had knowledge about complications related to negative blood groups during and after pregnancy [14]. On the other hand, the knowledge about RH incompatibility observed in the present study is much lower than that reported in a study done in Turkey, where 79.9% of the participants heard about Rh incompatibility [12].

Of our participants, 84.8% mentioned that negative blood groups need close follow up during pregnancy, 55.4% reported that negative Rh affect

baby condition after delivery, and 72.8% said that Rh incompatibility needs more care during pregnancy. In the previously mentioned Pakistanian study, the majority (94.3%) were not aware that what precautions should be taken if a mother's blood group is Rh negative [14].

Rh incompatibility has great importance as it may cause hemolytic anemia, hydrops fetalis (with ascites, pleural and pericardial effusions), and hyperbilirubinemia related kernicterus. To protect children from these risks in case of Rh incompatibility, anti-D Ig should be given within 72 hours of delivery to a postpartum non-sensitized Rh-negative woman delivering an Rh-positive infant [15]. The present work showed that most of the participants (89.3%) were aware that injection is given both before and after delivery.

Despite the higher percentage of knowledge among the highly educated females, this study showed that a non-significant difference was found between all levels of education of the participants and their knowledge about RH incompatibility ( $p=0.42$ ). A different result was found in previous Nigerian study(2016) done to assesses expectant mothers' knowledge and practices regarding maternal-fetal blood incompatibility, which found better knowledge among highly educated [13].

**Limitations:**

The small sample size and using an online survey is one of the limitations of this study. Another

limitation is the lack of involvement of both Rh-negative and Rh-positive females and fathers.

### CONCLUSION:

The present study showed that 39.7% of the participants knew about RH incompatibility, and a non-significant relationship was found between the participants' knowledge and their age, education level, marital status, pregnancy, consanguinity, or blood group. The lack of knowledge regarding some aspects related to RH incompatibility calls for health education campaigns directed to females. In addition, health care professionals should direct a health education message regarding this issue to their female clients, especially pregnant females.

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**Competing interests:** no competing interests.

### Consent for publication

Informed consent was obtained from all the participants

**Ethical approval:** Ethical approval for the study obtained from the Research Ethics Committee of faculty of medicine, Taif University, before starting data collection. Approvals were obtained from females to participate in the study.

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