Original Article

Knowledge, Attitude, and Practice of Junior Doctors about Thalassemia in Babylon Province

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Abstract

Background: Thalassemia is a chronic condition that is caused by hereditary defects in hemoglobin production. Thalassemia is classified into two major categories, named α- and β-thalassemia, according to the hemoglobin gene defect. Premarital screening in the family members, followed by prenatal diagnosis is the most effective strategy for control of thalassemia. The most important thing is the determination of the traits or carriers of thalassemia. In our country, doctors acquired knowledge about thalassemia when they were students in medical college and after graduation, they worked in different hospitals. Some of them had worked in the thalassemia unit whereas others had not. **Objectives:** To assess the knowledge, attitude, and practice of junior doctors about thalassemia in Babylon province. **Methodology:** A cross-sectional study was conducted on 200 junior doctors (resident doctors and permanent doctors) who had different years of experience and places of work in Babylon province. The knowledge, attitude, and practice were assessed according to scoring by a group of researchers. **Results:** A cross-sectional study of 200 junior doctors (resident and permanent doctors), whose age ranged from 24 to 34 years with a mean age of (27.5 ±2.27) years. Most of the junior doctors were females: 145 (72.5%) worked in the emergency department 107 (53.5%). There were 92 (46%) junior doctors who possessed adequate knowledge about thalassemia. There were a significant association between knowledge and age, position/job, and smoking: $P = 0.01$, 0.02, and 0.04, respectively. The doctors had a positive attitude and good practice about thalassemia, 65 (32.5%) and 84 (42%) respectively. Regarding attitude, there is a significant association between it and position/job, $P = 0.02$ and in practice there is a significant association between it and gender, which is more in females ($P = 0.02$). **Conclusion:** The doctors had adequate knowledge, positive attitude, and good practice about thalassemia: 92 (46%), 65 (32.5%), and 84 (42%), respectively.

Keywords: Junior doctors, knowledge, thalassemia

Introduction

Thalassemia is a genetic condition of blood cells. It is considered a major health problem in the world, in which hemoglobin (the main component of the blood and that has the ability for carrying oxygen in the blood) is below normal.[1] More than 200 different mutations or defects happened to the ß-globin gene, which is located on chromosome 11. Thalassemia is mainly distributed in tropical and subtropical areas such as Mediterranean countries, the Middle East, North Africa, the Indian subcontinent,, and Southeast Asia.[2] Thalassemia is classified into two major categories, named as α- and β-thalassemia, according to hemoglobin gene defect. Beta thalassemia is caused as a result of a deficiency or defect in two beta globin chains,[3] and it is divided into: thalassemia minor, caused by a defect in a single chain, where the patient is asymptomatic, but exhibits simple anemia during routine blood tests[4]; intermediate thalassemia, which is an intermediate condition between major types and minor types, where patients can live a normal life, but need blood transfusion in times of illness and pregnancy.[5] In the thalassemia major type, patients have severe anemia, hypertrophic and bone marrow swelling and need regular blood transfusions to sustain life; the symptoms happen

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during the first two years of the child's life and do not occur at the child's birth.[6] Alpha thalassemia is inherited in an autosomal recessive condition and is caused by a reduction in the production of alpha globin chains or their entire absence as a result of a mutation or deletion in one or more of the four alpha globin genes—two on each copy of chromosome 16. The normal type is demonstrated as αα, and its genotype is indicated as αα/αα. The deletion of one or both α globin genes results in (–α/) and (– –), respectively, which are considered the most common forms of α thalassemia. Based on the amount of functional globin gene inherited, these non-deletional and deletional forms of alpha thalassemia can be divided into four subtypes: silent carrier, HbH disease, alpha-thalassemia trait, and when all of the four genes are mutated (deleted or dysfunctional), the ensuing syndrome is hemoglobin (Hb), which known as Bart's hydrops fetalis or α thalassemia major (– – /– –) and this is incompatible with extrauterine life.[7] Premarital screening in the family members, followed by prenatal diagnosis is the most effective strategy for the control of thalassemia. Preventive methods are critical for preventing the illness from being passed down to the next generation. The identification of thalassemia traits or carriers is considerable. Prenatal diagnosis (PND) or Preimplantation Genetic Diagnosis (PGD) forms the most important role of a community control program for thalassemia.[8] PND can be administered to couples that are carriers of the illness as early as 9–10 weeks of pregnancy through chorionic villus biopsy (CVS). If the fetus is harmed, then the pregnancy can be terminated early.[9] If both the partners in a couple are carriers of thalassemia disorder, get married, their children are likely to be healthy (25%), have severe thalassemia (25%), and be carriers of thalassemia (50%).[10]

Aim of study

To assess the knowledge, attitude, and practice of junior doctors about thalassemia in Babylon province.

Materials and Methods

This study was a descriptive cross-sectional study that was used to assess the knowledge, attitude, and practice of junior doctors about thalassemia. Junior doctors comprise resident doctors and permanent doctors who are in different experience years.[11] Data collection was carried out in four different government medical hospitals in Babylon (Imam Sadiq Teaching Hospital, Marjan Medical City, Al Hilla Teaching Hospital, and Babylon Teaching Hospital for Gynecology and Pediatrics) from April 2021 to June 2021.

Ethical consideration

The study was conducted in accordance with the ethical principles that have their origin in the Declaration of Helsinki. It was carried out with patients verbal and analytical approval before sample was taken. The study protocol and the subject information and consent form were reviewed and approved by a local ethics committee according to the document number 78 (including the number and the date in 22/02/2021) to get this approval.

Results

The first portion of the report contained data on the sociodemographic variables as in Table 1. The knowledge portion was tested in the second half as in Figure 1. A total of 16 questions were asked. The answers were multiple-choice ones, except one, which was Yes/No. Each correct answer received a score of (1), the incorrect answer received a score of (0), and a score of more than or equal to 12 was awarded. When the participants successfully answered 12 out of 16 questions, it was considered adequate and less than 12 was regarded as adequate.[12] The following questions regarding knowledge were posed:

The genetic nature of thalassemia, the role of consanguineous marriage in causation, sex distribution of thalassemia, alpha thalassemia is caused by absence of which chain, beta thalassemia is due to absence of which chain, number of gene mutation in thalassemia major,

Table 1: Distribution of doctors according to study variables

Study variables	Frequency	Percentage
Age (years)	Mean ± SD	Range
	27.50 ± 2.27	11.00
Gender		
Male	55	27.5
Female	145	72.5
Total	200	100
Marital status		
Single	106	53.0
Married	92	46.0
divorced	2	1.0
Total	200	100
Position\job		
Resident doctors	132	66.0
Permanent doctors	68	34.0
Total	200	100
Smoking		
Yes	20	10.0
No	180	90.0
Total	200	100
Unit of work		
Emergency	107	53.5
Ward	80	40.0
RCU	9	4.5
CCU	4	2.0
Total	200	100
Years of experiment		
Below 1	16	8.0
1–5	149	74.5
6 or more	35	17.5
total	200	100

number of gene mutation in thalassemia carrier\ trait, how to diagnose thalassemia, management of disease, methods of prevention, life expectancy of thalassemia major, life expectancy of thalassemia minor, most common type of thalassemia in Iraq, Facilities of thalassemia testing at government set up, chance of having thalassemia child in both carrier parents, chance of having thalassemia carrier child in one parent.

The third section deals with the attitude that is assessed by a series of 10 questions as in Figure 2. Each right response received a score of 1, and each incorrect answer received 0. Positive attitude was defined as a score greater than or equal to 8; negative attitude was defined as a score less than 8.[12] The participants were asked as to whether: they would like to marry a thalassemia carrier, not prefer consanguineous marriage, want to test blood for thalassemia, want to test spouse and children for thalassemia, prefer mandatory premarital counseling / screening, both carrier people should not marry, carrier couple should not have a pregnancy, carrier couple should do prenatal diagnosis, carrier couple should do medical termination of pregnancy if the result of the prenatal diagnosis is found positive for thalassemia, and want to donate blood for patients with thalassemia.

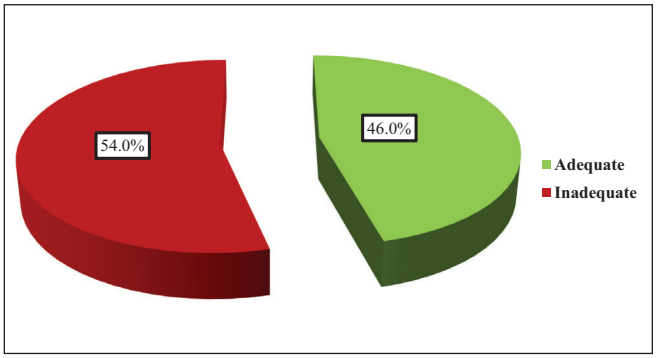

Figure 1: Distribution of doctors according to knowledge about thalassemia

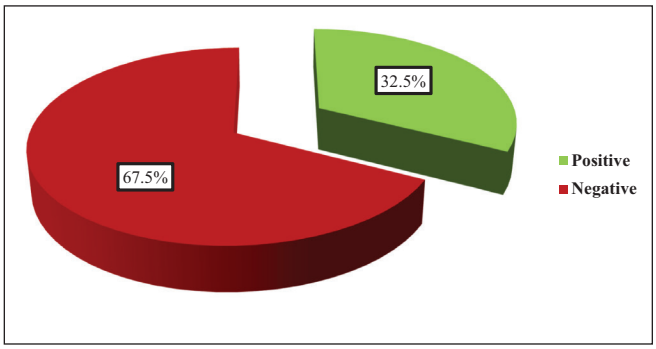

Figure 2: Distribution of doctors according to attitude about thalassemia

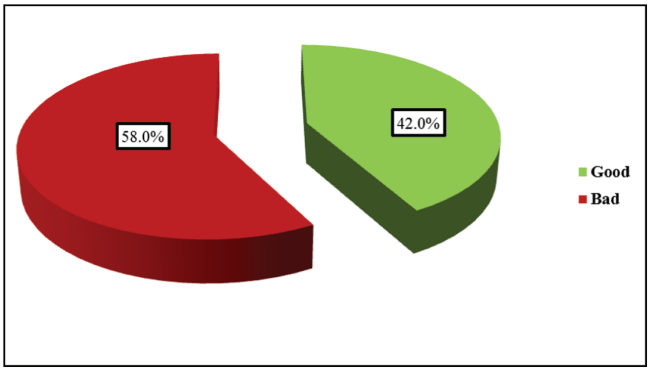

Figure 3: Distribution of doctors according to practice about thalassemia

The fourth section is about practices as in Figure 3 and was 8 statements and with 1 score for each one that was true, practices were considered as good with score equal or more than 6and bad if score was less than 6.[12] The following questions were asked:you do a blood test for thalassemia, Blood test of spouse and children done for thalassemia, Advise blood test for thalassemia, Pre_ marital carrier screening (PMCS) done among family member, Pre _natal diagnosis(PND) done among family member, donate blood for thalassemia patient, Marry a carrier person in the family, Attended lectures/work shop/continuing medical educations for thalassemia in 3 years.

Junior doctors included resident doctors and permanent doctors, who were available during data collection days. A total of 209 junior doctors were included, the response rate was 96%, the number of refusals was nine, and the refusal rate was 4%. A pilot study, which is a validated pretested study, was performed on 10 doctors for two days, to assess the time needed for data collection and assess the questionnaire and it was done in Babylon province.

The time of the study was short, making the study limited and not all participants comprising doctors participated in the study (nine doctors refused to participate). This study was approved by the scientific committee of the Community Medicine Department in the College of Medicine/ University of Babylon. Written agreements were obtained from Babylon health directorate. Verbal consent was obtained from every doctor before data collection. SPSS version 25 was used for statistical analysis. Frequencies and percentages were used to present categorical variables. (Means ± SD) was used to represent continuous variables. To compare means between two groups, a student t-test was utilized. The relationship between categorical variables was determined by using Pearson's chi square (X^2) and Fisher-exact tests. A value of $P \leq 0.05$ was deemed significant.

Discussion

This study was a cross-sectional one, including 200 junior doctors (residents and permanent doctors). As noted in Table 1, female gender constituted most of the

study participants: 145 (72.5%); however, in Chatterjee *et al*.[12] it was less, 53 (28.19%). As noted in Table 1, the contributing factors of thalassemia knowledge were: married individuals, male gender. However, in the Iran study[13] and Bahrain study,[14] females showed better knowledge of thalassemia than males. As noted in Table 1, regarding position/job, there are 132 (66%) participants of resident doctors while study in Delhi NCR by Pujani *et al*.,[15] all participants were students from final 1st and 2nd years of medical college. As noted in Table 1, most of the junior doctors were working in the emergency department at the time of the questionnaire taking 107 (53.5%) while in Pujani *et al.* all participants were medical students in final years 1st and 2nd. As noted in Table 2, regarding knowledge, there were 92 (46%) junior doctors who possessed adequate knowledge about thalassemia (score less than 12). It was incomparable to study of by Chatterjee *et al.* on Indian junior doctors which were 148 (78.72%) adequate knowledge and the causes of this differences are due to many junior doctors do not attend medical education for thalassemia and not all working in thalassemia unit so there knowledge were less. We found that about 132 (66%) adequate knowledge about genetic nature of thalassemia compared to 160 (85.11%) by study of Chatterjee *et al.* There were 156(78%) adequate knowledge about number of thalassemia carrier gene and 193 (96.5%)adequate knowledge about thalassemia compare in Chatterjee *et al.* which were 172(91.49%). In management and prevention by pre-natal carrier screening and pre-natal diagnosis and in our study, the answers were

Table 2: Mean differences of age according to knowledge (n = 200)

Study variable	Knowledge	*N*	Mean	SD	*t* test	*P* Value
Age	Adequate	92	27.95	2.44	2.59	**0.01***
	Inadequate	108	27.12	2.06		

There were significant differences between means of age according to study group (P = 0.01). The mean knowledge increases with an increase in age

Table 3: Association between knowledge of doctors about thalassemia and study variables

Study variables	Knowledge		Total	*P* Value
	Adequate	In adequate		
Gender				
Male	24 (26.1%)	31 (28.7%)	55 (27.5%)	
Female	68 (73.9%)	77 (71.3%)	145 (72.5%)	68.0
Total	92 (100.0%)	108 (100.0%)	200 (100.0)	
Marital status				
Single	47 (51.1%)	59 (54.6%)	106 (53.0%)	0.83
Married	44 (47.8%)	48 (44.4%)	92 (46.0%)	
Divorced	1 (1.1%)	1 (0.9%)	2 (1.0%)	
Total	92 (100.0%)	108 (100.0%)	200 (100.0%)	
Position/job				
Resident doctors	53 (57.6%)	79 (73.1%)	132 (66.0%)	
Permanent doctors	39 (42.4%)	29 (26.9%)	68 (34%)	0.02*
Total	92 (100.0%)	108 (100.0%)	200 (100.0%)	
Smoking				
Yes	5 (5.4%)	15 (13.9%)	20 (10.0%)	
No	87 (64.6%)	93 (86.1%)	180 (90.0%)	0.04*
Total	92 (100.0%)	108 (100%)	200 (100.0)	
Unit of work				
Emergency	44 (47.8%)	63 (58.3%)	107 (53.5%)	
Wards	45 (48.9%)	35 (32.4%)	80 (40.0%)	
RCC	2 (2.2%)	7 (6.5%)	9 (4.5%)	0.059
CCU	1 (1.1)	3 (2.8%)	4 (2.0%)	
Total	92 (100.0)	108 (100.0%)	200 (100.0%)	
Years of experiment				
Below 1				
1–5	9 (9.8%)	7 (6.5%)	16 (8.0%)	
6 or more	62 (67.4%)	87 (80.6%)	149 (74.5%)	
Total	21 (22.8)	14 (13.0%)	35 (17.5%)	0.10
	92 (100.0)	108 (100.0%)	200 (100.0%)	

There is significant associations between knowledge and position\job and smoking, P = 0.02 and 0.04, respectively

good in this study 146(98%) and 176(88%) respectively similar to Chatterjee *et al.* were 175(93.08%) and 130(69.15%) respectively. The number of answers of the chance of having thalassemia child in both carrier parent were 79(39.5%) while in Chatterjee *et al.* were 111(59.4). The chance of having thalassemia child in one carrier parent, its answers were in our study 88(44.0%),lower than in Chatterjee *et al.* were 112(59.57%). Knowledge was compared with the various variable of study, there was significant relationship between age, position /job and smoking as noted in Table 2, in our study (increasing in percentage of knowledge with increasing age (P = 0.01) were as no relationship was found between thalassemia knowledge and age group in Basu,[16] position/job (P = 0.02) and smoking (P = 0.04) as noted in Table 3 which is similar to Chatterjee *et al.* in significant relationship of age. As noted in Table 3, there is no gender different and knowledge of doctor about thalassemia P = 0.68 and also no different in marital status P = 0.83. Regarding years of experience; there was no significant relationship P = 0.059 and 0.10 respectively as noted in Table 3. The percentage of attitude of doctors about thalassemia in this study, were 65(32.5%) positive only lower than in Chatterjee *et al.*[12] were 152 (80.85%) positive and Basu[16] which showed 83.88 positive. Thalassemia carrier and preference of consanguineous marriage answers were 35(17.5%)and 155(77.5%) in this study respectively lower than in Chatterjee study which were 103(54.78%) and 156(82.97%) respectively. Regarding testing of blood for thalassemia for themselves were 141 (70.5%) while testing blood for spouse and children for thalassemia answers were 143(71.5%) lower than in Chatterjee which were 152 (80.85%) and 155(82.44%) respectively. Preference of mandatory pre-marital carrier screening answers were 161 (80.5%) slightly higher than in Chatterjee *et al.* which were 160 (85.10%). Doing pre-natal diagnosis answers among carrier couple were 162 (81%) slightly higher than in Chatterjee answers which were 161 (85.64%). As noted in Table 4, there was a significant relationship between position/job (residents and permanents) and attitude, with a P = 0.02; however, there was no association of age, gender, marital status, smoking, unit of work, and years of experiments with attitude of doctors, with P = 0.26, 0.33, 0.59, 0.80, 0.55, and 0.62, respectively. There was a positive association between the age and attitude toward thalassemia in Haque *et al.*[17] In our study, the good

Table 4: Association between the attitude of doctors about thalassemia and study variables

Study variables	Attitude		Total	*P* Value
	Positive	Negative		
Gender				
Male	15 (23.1)	40 (29.6%)	55 (27.5%)	0.33
Female	50 (76.9)	95 (70.4%)	145 (72.5%)	
Total	65 (100%)	135 (100.0%)	200 (100%)	
Marital status				
Single	37 (56.9)	69 (51.1%)	106 (53.0%)	
Married	28 (43.1)	64 (47.4%)	92 (46.0%)	
Divorced	0 (0.00)	2 (1.5%)	2 (1.0%)	0.59
Total	65 (100%)	135 (100)	200 (100)	
Position/job				
Resident doctors	50 (76.9%)	82 (60.7%)	132 (66.0%)	
Permanent doctors	15 (23.1%)	53 (39.3%)	68 (34.0%)	**0.02***
Total	65 (100.0%)	135 (100.0%)	200 (100.0)	
Smoking				
Yes	6 (9.2%)	14 (10.4%)	20.0(10%)	
No	59 (90.8%)	121 (89.6%)	180 (90.0%)	0.80
Total	65 (100%)	135 (100%)	200 (100.0)	
Unit of work				
Emergency	38 (58.5%)	69 (51.1%)	107 (53.5%)	
Ward	22 (33.8%)	58 (43.0%)	80 (40%)	
RCU	4 (6.2%)	5 (3.7%)	9 (4.5%)	0.55
CCU	1 (1.5%)	3 (2.2%)	4 (2.0%)	
Total	65 (100%)	135 (100%)	200 (100%)	
Years of experiment				
Below 1	5 (7.7 %)	11 (8.1%)	16 (8.0%)	
1–5	51 (78.5%)	98 (72.6%)	149 (74.5%)	0.62
6 or more	9 (13.8%)	26 (19.3%)	35 (17.5%)	
Total	65 (100.0%)	135 (100.0%)	200 (100.0%)	

There were significant associations between position/job and attitude (P = 0.02)

Table 5: Associations between practice of doctors about thalassemia and study variables

Study variables	Practice		Total	*P* Value
	Good	Bad		
Gender				
Male	16 (19.0%)	39 (33.6%)	55 (27.5%)	
Female	68 (81.0%)	77 (66.4%)	145 (72.5%)	**0.02***
Total	84 (100.0%)	116 (100.0%)	200 (100.0%)	
Marital status				
Single	41 (48.8%)	65 (56 .0 %)	106 (53.0%)	
Married	42 (50.0%)	50 (43.1%)	92 (46.0%)	0.58
Divorced	1 (1.2%)	1 (0.9%)	2 (1.0%)	
Total	84 (100.0%)	116 (100%)	200 (100.0%)	
Position/job				
Resident doctors	52 (61.9%)	80 (69.0%)	132 (66.0%)	
Permanent doctors	32 (38.1%)	36 (31.0%)	68 (34.0%)	0.29
Total	84 (100.0%)	116 (100.0%)	200 (100.0)	
Smoking				
Yes	5 (6.0%)	15 (12.9%)	20 (10.0%)	
No	79 (94.0%)	101 (87.1%)	180 (90.0%)	0.10
Total	84 (100.0%)	116 (100.0%)	200 (100.0%)	
Unit of work				
Emergency	52 (61.9%)	55 (47.4%)	107 (53.5%)	
Ward	28 (23.3%)	52 (44.8%)	80 (40.0%)	
RCU	4 (4.8%)	5 (4.3%)	9 (4.5%)	0.09
CCU	0 (0.0%)	4 (3.4%)	4 (2.0%)	
Total	84 (100.0%)	116 (100.0%)	200 (100.0%)	
Years of experiment				
Below 1	9 (9.8%)	7 (6.5%)	16 (8.0%)	
1–5	26 (67.4%)	87 (80.6%)	149 (74.5%)	0.10
6 or more	21 (22.8%)	14 (13.0%)	35 (17.5%)	
Total	92 (100.0%)	108 (100.0%)	200 (100.0%)	

There were significant associations between gender and practice of doctors about thalassemia ($P = 0.02$)

practice of doctors about thalassemia was 84 (42.0%), which was higher than in Chatterjee *et al*.,[12] which was 63 (33.51%), and it was also lower in final year medical students according to Sohai *et al*.,[18] which was 23 (5.3%). This study proved that participant doctors had bad practice about thalassemia, but its percentage was higher than that in another study (Chatterjee *et al.* and Sohai *et al*.). Donate blood of thalassemia patients answers in our study were 120(60.0%), in Chatterjee *et al.* answers were 72(38.30%). As noted in Table 5, there was a significant association between position /job of doctors (resident and permanent doctors) and the practice of patients about thalassemia $P = 0.29$ and a significant role of the practice of doctors about thalassemia and gender (more in female), $P = 0.02$. There was no relationship between age, marital status, smoking, unit of work, and years of experiments and the practice of doctors about thalassemia, $P = 0.54$, 0.58, 0.10, 0.09, and 0.10 respectively.

Conclusion

The junior doctors include residents and permanent doctors. The study revealed that only about 92 (46%) had adequate knowledge about thalassemia, and the total number of doctors was 200. The doctors had a negative attitude and bad practice about thalassemia, 135 (67.5%) and 116 (58%) respectively, and there was a need to study thalassemia among doctors very well. As noted in Table 5, there was a significant association between knowledge and age, position/job, and smoking, $P = 0.01$, 0.02, and 0.04. However, there was a significant association between attitude and position/job, $P = 0.02$ and in practice there was a significant association between it and gender, which is more in females, $P = 0.02$.

Recommendations

1. The emphasis on thalassemia learning in undergraduates will improve junior doctors' knowledge, attitude, and practice about this deadly disorder.
2. More interaction of medical students with patients with thalassemia and their families in hospitals in thalassemia centers where these children received blood transfusions and other services to increase knowledge, attitude, and practice score
3. The need of resident doctors for working in thalassemia centers increases the knowledge of junior doctors about thalassemia, as they play an important

role in the prevention of this disease by preventing consanguineous marriage in both carrier couples and the screening of affected people by conducting the history and investigation.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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