Evaluation of premarital screening tests in AL Diwanyia governorate

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Abstract

Introduction

Pre-marital Screening (PMS) is define as a group of tests in which couples that are going to get married are tested for common genetic blood disorders**.** Hemoglobinopathies are predominantly single-gene autosomal recessive disorders passed down through families (inherited) that result in reduction in the synthesis of structurally normal globin (β-thalassemia) or a production of structurally abnormal hemoglobin variants**.**

Method

A record base cross sectional study enroll data of 19657 individuals that attendant centers of pre marriage screening in AL Diwanyia general hospital in Diwanyia governorate from January to December 2018.

Result

These study enroll 19657 partner attendant premarital screening centers. Mean age for women 23±5.6 years and for men 29±8.2.forty two percent of attendants examination were occurred in AL Diwanyia general hospital, 21% in Hamza general hospital, 22% of them in Shamia general hospital and 15% in Afaq general hospital

Conclusion

The benefit from encouragement the screening for heamoglobinopathies in premarital screening program not get till now.

Introduction

Pre-marital Screening (PMS) is define as a group of tests in which couples that are going to get married are tested for common genetic blood disorders (mainly hemoglobinopathies, e.g. thalassemia and sickle cell anemia) and infectious diseases (e.g. hepatitis B, hepatitis C, and HIV/AIDS)[1]. Premarital screening also include testing for other sexual-transmitted diseases like(syphilis, gonorrhea), blood grouping and resus factor to prevent as much as possible transmitting disease to the other partner or children and to provide partners with options that help them plan for healthy family[2].The premarital screening reduces the spread of those diseases and reduces the financial burdens of their treatments, and also reduces the burden on health facilities and blood banks. PMS would avoid any future social and psychological problems of families[3].

Hemoglobinopathies are predominantly single-gene autosomal recessive disorders passed down through families (inherited) that result in reduction in the synthesis of structurally normal globin (β-thalassemia) or a production of structurally abnormal hemoglobin variants (sickle-cell disease) [4].

The most common clinically significant conditions in the world are thalassaemias, affecting equally males and females and occurs in

4.4/10000 live births, thalassemic patients can have mild or severe life-threatening anaemia which usually requires regular blood transfusions for lifecausing much morbidity and early mortality, the majority of patients die before 20 years and with a great misery for a family both financially and emotional[3].

Sickle cell disease is the other types of heamoglobinopathes caused by a mutation in both copies of the β-globin genes resulting inhaemoglobin variant , sickle cell disease individual may suffer from chronic aneamia due to increase destruction of red blood cell, autosplenectomise in early life, experience sickle cell crises with bone and chest pain and residual organ damage and require medical management, which may includeregular blood transfusions[5]. According to the WHO approximately 7% of world's population are inherited for haemoglobinopathies including thalassaemias and sickle cell disease[4].

Thalassemia represented 75% of all hemoglobinopathies in Iraq, with a prevalence of 36/100,000 population, and incidence of 34/100,000 live births.β-thalassemia major represented 67% of all types of thalassemia[6]. The prevalence of SCD about 14/100000[6].

Consanguineous marriagesor relative marriages (and more specifically first-cousin marriages) are so common in the Middle East and children of consanguineous marriages are at increased risk for genetic diseases and congenital malformations(2.5 times higher than the rate among the children of non-consanguineous parents)[7]

Hepatitis B virus (HBV) is a viral infection that attacks the liver and can cause acute and chronic hepatitis, cirrhosis, and hepatocellular carcinoma (HCC)[8]. WHO estimated 257 million people are living with hepatitis B virus infection, in 2015, hepatitis B resulted in 887 000 deaths, mostly from complications[9]. In the majority of Middle East countries the prevalence of HBV infection about 4.3 million is of intermediate (2--- 5%)[10]. The hepatitis B virus can survive outside the body 7 days, and can cause infection if it enters the body of a person who is not protected by the vaccine[10].

Hepatitis C

Hepatitis C (HCV) is another viral infectionattack the liver and causes both acute and chronic infection. Acute HCV infection is usually asymptomatic, and very rarely associated with life-threatening disease.[11]

WHO estimated 71 million people have chronic hepatitis C infection, A significant number of them will develop cirrhosis or liver cancer, from those about 399 000 people die each year. Although the antiviral medicines can cure more than 95% of persons with hepatitis C infection, but access to diagnosis and treatment is low[10].In Iraq in the general population consider Low endemicity and prevalence in Iraq (0.5%) [11].

HIV/AIDS

The human immunodeficiency virus (HIV) infects cells of the immune system and impairing their function,Acquired immunodeficiency syndrome (AIDS) is a term which applies to the most advanced stages of HIV infection[12]

HIV/AIDS is a blood-borne and sexual transmitted disease; it transmits also from mother to child during pregnancy, delivery, and breast feeding. The WHO and UNAIDS estimate that 36.7 million people were living with HIV globally at the end of 2017. That same year, some 1.8 million people became newly infected, and 1 million died of HIV-related[12]. Although its prevalence is low (less than 0.2%) in the Middle East and North Africa[12].

Aim of study

To evaluate the premarital screening program in Al Diwanyia governorate

Method

A record base cross sectional study enroll data of 19657 individuals that attendant centers of pre marriage screening in AL Diwanyia general hospital in Diwanyia governorate from January to December 2018.

premarital examination for partners include the following data, Socio-demographic data: name, age, and occupation, in addition to the degree of consanguinity between them. And history of medical diseases for both.

Family history such as inherited blood diseases (thalassemia, sickle cell anemia, and hemophilia), mental disability, and congenital physical handicap.

Second part physical examination for partners.

Thirdly laboratory investigations, blood grouping and Rh factor, RBC indices (MCV and MCH), VDRL, HBsAg, and tests for HIV and tuberculosis.

Beta thalassemia carrier is defined as follows: "The meancorpuscular volume (MCV) is lower than 80 μm3 (fL)/red cell, MCH below 27 and the hemoglobin A2 level is more than 3.5%".

Those whowere "HbS positive" were considered to be carriers of sickle cellanemia.

For the diagnosis of hepatitis B, HIV and syphilis carrier, HBsAg, anti-HIV I/II and Treponema pallidum antibody(VDRL and TPHA) levels were evaluated, respectively.

HBSAg positivity was defined as hepatitis B carrier (Hepatitis B (+)), and anti-HIV I/II positivity as HIV carrier (HIV (+)), and VDRL and TPHA positivity as syphilis carrier (syphilis (+))was defined.

Pre-marriage health centers

In our governorate there is four health centers introduce services for pre marital couples which present in every districts.

Firstly in Diwanyia teaching hospital in center of governorate. In districts of Afag, Hamza, Shamia the center lie in general hospital of these cities.

Procedure

After taken history and doing physical examination for couples, refer him to laboratory. Venous blood samples are taken from couples who apply for marriage, for hemoglobinopathies and infectious diseases screening.

The blood sample is taken into blood tubes containing EDTA and evaluate in laboratory of hospital.

According to the test results, consultation is given about genetic - hereditary diseases, the persons are inform and they are direct to appropriate centers for the necessary medical services in accordance with the results of the tests.

The screening result is mandatory and required to complete the official marriage license.

Usually Premarital examination and counseling is completed in 2-3 visits in normal situation.

Data collection of study

We gathering data actively and passively, every month during a year reach to public health department monthly report from premarital screening centers, these summary form which is containing different data about program such as sum of couples attendant monthly and number and types of investigation which did for them finally action which were taken by health facility in according to result of examination. On other hand routinely we are doing monitoring and supervisor visit to all centers during the year in before hand implanted plan, for every visit general assessment and evaluation of program of pre marriage screening in each hospital for example site of examination and counseling room, review procedure of investigation, quality of data taken from couples, also we are observe documentation and how reserve it.

Permission was obtained from public health department for doing of this study.

Result

These study enroll 19657 partner attendant premarital screening centers. Mean age for women 23±5.6 years and for men 29±8.2.forty two percent of attendants examination were occurred in AL Diwanyia general hospital, 21% in Hamza general hospital, 22% of them in Shamia general hospital and 15% in Afaq general hospital as ashown in figure and table one.

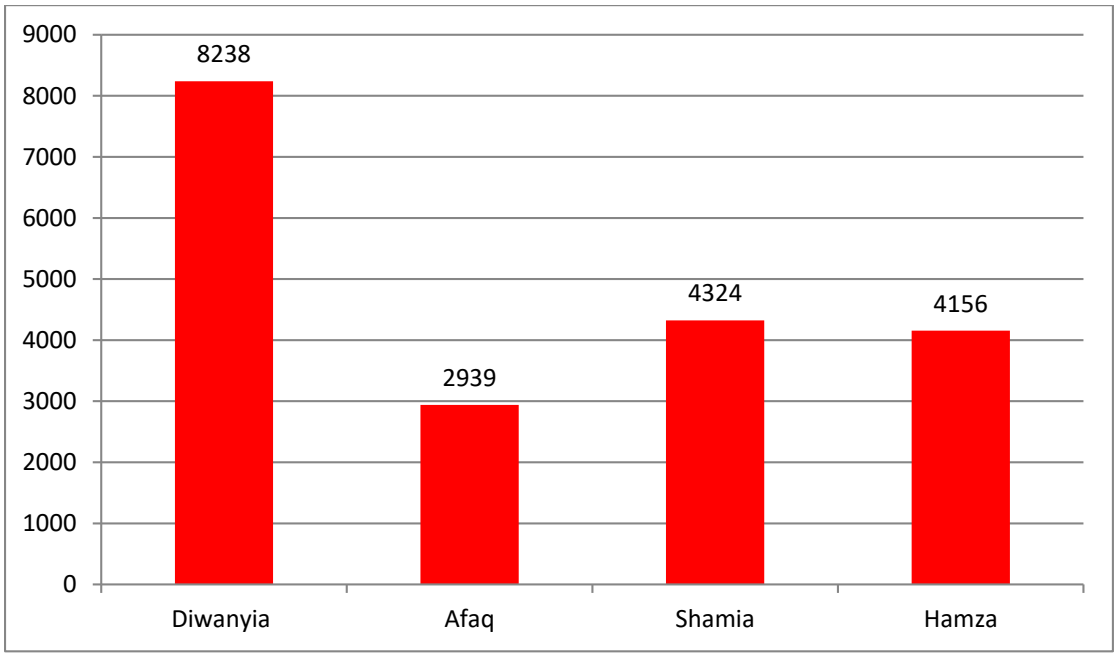

figure 1:show the number of attendants that were examined by each hospital.

Name of centers	Number	Percent
Hamza	4156	21%
Shamia	4324	22%
Afaq	2939	15%
Diwanyia	8238	42%
Total	19657	

In table two show the significant result during a year of premarital screening, in which 19 person appear positive for screening for thalassemia, only one individual had HIV positive, nine persons VDRL positive test, eleven attendant had surface antigen of hepatitis type B and 3 individual had positive HCV infection.

Table 2:- show the positive results by screening test

Test result	Number
MCH<27 , MCV<80	19
HIV	1
VDRL	9
HBS	11
HCV	3

Seven persons with HBV infection were male and 4 female, for HCV infection were 2 male and only one female, individual with positive HIV test was male, as shown in table 3.

Table 3 :- show gender distribution in test positive result.

		HBV	HCV	HIV
Gender	Male	7	2	1
	Female	4	1	0
Total		11	3	1

According to residency of patients, all patients that had HCV infection live in Diwanyia city, the patient infected by HIV infection resident temporally in Shamia, while for HBV 7 patients were lived in Diwanyia, 2 patients in Hamza and 2 in shamia, as shown in table 4.

Table 4:residence distribution.

		HBV	HCV	HIV
Residency	Diwanyia	7	3	0
	Shamia	2	0	1
	Hamza	2	0	0
	Afaq	0	0	0
Total		11	3	1

The number of attendants differ during the year reached to 2338 in April month in February the were 2204 in June 2118 and in august 2074, lowest number 346 in October month these data shown in figure 2.

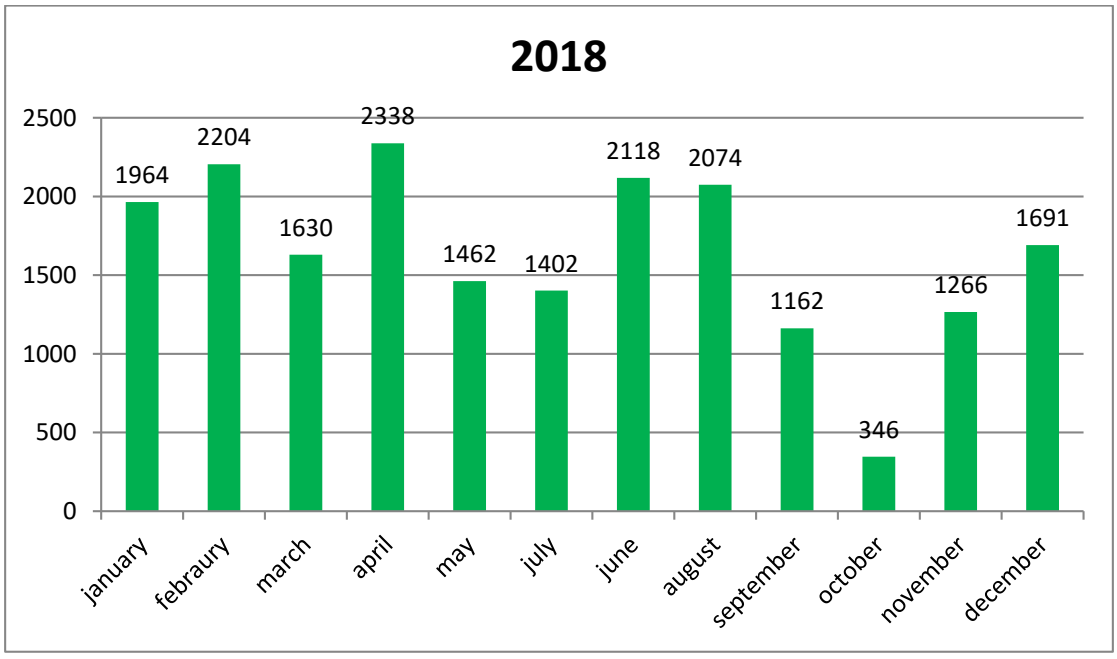

Figure 2 : show the number of monthly attendants.

	Suspicion of thalassemia
Our study	0.09%
Basra	4.6%
Baghdad	4.4%
Duhok	3.7%
Iran	6%
Turkey	1.8%
Saudi	3.4%
Jordan	3.5%
Syria	5%

Discussion

With approximately 7% of the worldwide population being carriers, hemoglobinopathies are the most common monogenic diseases and one of the world's major health problems. In many parts of world today, hemoglobin (Hb) defects are classified as endemic diseases[13].

Iraq is one of the countries which are endemic with different types of heamoglobinopathies. There are several epidemiological studies on their frequency. The prevalence of gene carriers is high giving a figure of millions among the entire population[6]. The total number of patients diagnosed with these diseases in the MOH laboratories during the last years is tens of thousands[6]. Thus, detection and advice about these disease becomes the corner stone element in Premarital screening in order reduce the burden of this problem, And to inform couples about their chances of producing affected children and ensure they receive appropriate advice[14].

Our result reveal only 19 individuals diagnosis as carrier for thalassemia gene, which are lower than reported by others study in Iraq, in Duhok 44 (3.7%) in Baghdad 4.4% and in Basra were reported 4.6% prevalence of thalassemia carrier in couple were attending premarital center[14].

Studies in Turkey country north to Iraq reveal different prevalence rate range from 2%-6% depend on site of study, newly study reported 1.8% which still above the rate by our study. Differences in the prevalence of thalassemia carriage in same country can be attributed to differences in diagnostic criteria and laboratory methods used in researches[15].

Other countries like in Iran rate range from 4%–10% in various regions of the Republic of Iran [14]. A figure of 3.0%–3.4% was reported from Saudi Arabia (16) while prevalence in Jordan was reported to be 3.0%–3.5% . In the Syrian Arab Republic, the estimated prevalence was 5% [17].

In our location diagnosis of thalassemia need further assessment in which refer patients other center for further tests depend on doctor opinion, other obstacle partner refuse further referral to other hospital for electrophoresis, on other hand many partner prefer private sector investigation outside of hospital to complete investigation some time, further more doctor diagnosis different causes of anemia and give them treatment as need. In addition in 3 of 4 centers have not special rooms for physician examination of partners, instead of it they doing it in consultant clinic of hospital, for these reasons we think the

benefit from program for decrease prevalence of genetic diseases is not being get.

The Al Diwanyia thalassemia center registered about 35,29,32 during a year of 2016, 2017, 2018 respectively .This figure emphasizesthe potential recurring burden ofdisease and the need for an effective preventionprogramme to reduce that burden.

Other results in our study for infectious diseases, which are reveal one patient diagnosed with HIV, three patients were HCV positive and 11 patients were HBV positive in prevalence rate (0.05% for HBV).
In Iraq, there have not been many publications offering prevalence of hepatitis B carriers or HCV for premarital health screening. In study in Duhok they found the prevalence of HBV infection was 1.1% (N=22), HCV seropositivity was 0.2% (N=4)[7], also our result it was lower than that found by the study done in 2012 at Sulaimani in the premarital
population which was 0.67%[19].

In other country such as Saudi Arabia reveal 1.95 prevalence rate for HBV and 0.45 for HCV[20].

In Turkey, 119 pre-marriage surveys were conducted in a state
hospital in Mardin and 4.5% of carriers of hepatitis B were reported[21]. Since the number of participants in this study is low the prevalence value determined may seem high compared to our study.
Lower HBV rate in our study may be related the implementation of HB vaccination since years in vaccination schedules in Iraq and to vaccination of risky groups many times.

Other reason may be low efficiently of laboratory procedures, as we see different in Afaq center no discover any one during a year.

In general, Iraq consider one of country moderate prevalence in comparison to world and the low rate premarital screening may be due to the fact that in the age of marriage below to general population the had infected by HBV.
The findings of the current study and all the above facts discussed support
the notion of establishing a preventive program for haemoglobinopathies based on the concept of premarital screening,counseling and prenatal diagnosis with the aim of reducing the numbers of affected children born in the region.

Conclusion

The benefit from encouragement the screening forheamoglobinopathies in premarital screening program not get till now.

Recommendation

1-review the processes of premarital screening program

2-training the workers in these program like the doctors or lab workers

3-provide isolate rooms to examination and counseling

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