

Premarital Screening Program in Al-Nuaman Teaching Hospital

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Abstract

Background	Premarital blood screening helps couples to identify potential health problems and risks for themselves and their offspring, considered a primary preventive approach for couples planning for conception and an important step towards protecting society from spread of diseases especially thalassemia, and allowing people to enjoy life.
Objective	To determine the prevalence of minor β-thalassemia, human immunodeficiency virus (HIV), hepatitis B virus (HBV), hepatitis C virus (HCV) and venereal disease research laboratory (VDRL) referred to Al-Nuaman Teaching Hospital.
Methods	The cross-sectional study as part of premarital screening in Al-Nuaman Teaching Hospital was conducted over six months from May 2017 to the end of October 2017. Total individual of 3027 underwent routine mandatory tests.
Results	Regarding HIV and VDRL cases were zero, regarding HBV was no case in August, only one case in May and June, two cases in September and October, and four cases in July, regarding HCV there was no cases in May, June and Aug., two cases in September, and October, and three cases in July, Regarding β-thalassemia minor, one couple in August and another couple in September, those two couples both male and female were thalassemia minor , while the rest either the male or female were thalassemia minor.
Conclusion	Premarital screening program is an important project in detecting asymptomatic carriers of hepatitis viral infection and thalassemia. This study showed that incidence of hepatitis B infections 0.33% were more frequent than Hepatitis C infections 0.23%, there was no cases of HIV infection detected so far, and β-thalassemia trait prevalence was 1.92%.
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List of abbreviations: EDTA = Ethylenediaminetetraacetic acid, ELISA = Enzyme-linked immunosorbant assay, HBV = Hepatitis B virus, HCV = Hepatitis C virus, HIV = Human immunodeficiency virus, MCH = Mean corpuscular hemoglobin, MCV = Mean corpuscular volume, VDRL = Venereal disease research laboratory

Introduction

Premarital blood screening helps couples to identify potential health problems and risks for themselves and their offspring. A healthy-looking person may have undetected health problems, or be a silent

carrier of infectious diseases ⁽¹⁾. Premarital screening are important steps for the prevention of genetic blood disorders such as hemoglobinopathy ^(2,3), and considered a primary preventive approach for couples planning for conception and an important step towards protecting society and allowing people to enjoy life ⁽⁴⁾, particularly be important in the prevention of the spread of disease ⁽⁵⁾. All couples with marriage plans are required to be tested for human immunodeficiency virus

(HIV), hepatitis B virus (HBV) and hepatitis C virus (HCV) and to have the appropriate counseling (if required) before completing their marriage plans⁽⁶⁾. Premarital thalassemia screening was first carried out in 1975 by Silvestroni and in Latum, Italy, as part of a school prevention program⁽⁷⁾. Thalassemia is common, incurable, autosomal recessive inheritable haemoglobinopathy that cause significant morbidity and mortality and impose a heavy financial burden on society. A simple blood test before marriage can easily detect carriers of these diseases, to inform couples about their chances of producing affected children and ensure they receive appropriate advice⁽⁸⁾. The goal of complete eradication for β-thalassemia was met in Cyprus, Italy, and Greece⁽⁹⁾. In this program, red cell indices are checked, if mean corpuscular hemoglobin (MCH) <27 pg or mean corpuscular volume (MCV) <80 fl (cut off values) were found in both couples, hemoglobin A2 concentrations will be measured. If it is confirmed as characteristic for minor β-thalassaemia (Hb A2 >3.5), the couples were referred for counseling. In reference hematology books and also in literature, different cut off values have been mentioned for MCH and MCV, which might be due to the difference in the characteristics of the studied populations, such as age and race^(10,11).

This research was conducted to determine the prevalence of minor β-thalassemia, HIV, HBV, HCV and Venereal disease research laboratory (VDRL) in individuals underwent routine mandatory premarital tests referred to Al-Nuaman Teaching Hospital. This is because sexual intercourse is an important route of transmission for HBV, HCV and HIV infections. The determination of a carrier status during premarital testing will create awareness between the couples, lead to the protection of the prospective spouse by early vaccination which is imperative⁽¹²⁾.

Methods

This cross-sectional study as part of premarital screening in Al-Nuaman Teaching Hospital, was conducted over six months from May 2017 to the end of October 2017, total individual of 3027 (1513 couples and one female her male was outside Iraq) underwent routine mandatory tests and blood samples collected from venous blood was taken into an ethylenediaminetetraacetic acid (EDTA) tube and the complete blood count and red blood cell indices were measured by Abbot automated cell counter on the same day of blood collection. Subjects were considered to have β-thalassemia trait if they had MCV <80 fl, MCH <27 pg and a hemoglobin A2 level >3.5%. A second gel tube blood sample were allowed to clot and centrifuged at 1000 rpm for five minutes. The serum was separated and used for the screening of HIV, HBV and HCV viruses by enzyme-linked immunosorbant assay (ELISA) to detect antibodies in plasma against HCV (indirect ELISA), HIV type 1,2, or subtype 0 (sandwich ELISA), and to detect hepatitis B surface antigen (HBsAg) by (sandwich ELISA). Then for syphilis rapid test cassette one step rapid test.

Couples with safe marriage test results were issued instant compatibility certificates while at-risk couples were asked to attend meetings the counselors explained to the couple members the potential hazards of their proposed marriages and the voluntary nature of their compliance.

Results

This study was conducted to 3027 subjects who were attending the Al-Nuaman Teaching Hospital for premarital screening, age was ranging from 17 years to 47 years of either sex, they were couples males and females with the exception of one couple whose the male was outside Iraq, and the result regarding HIV, VDRL was zero, regarding HBV was no case in August, only one case in May and June, two cases in September and October, and four cases in July, regarding HCV there was no cases in May, June and August, two cases in September, and October and three cases in July (Table 1).

Regarding β-thalassemia minor total percentage was 1.9% as just one couple in August and another couple in Sept. (Table 2).

Table 1. Frequency and percentage of virology, VDRL and Rh screen

Months	No.	HIV	VDRL	HBV No.	HCV No.	Rh -ve No
		No. (%)				
May	666	0 (0.0)	0 (0.0)	1 (0.15)	0 (0.0)	39 (5.85)
June	243	0 (0.0)	0 (0.0)	1 (0.41)	0 (0.0)	19 (7.81)
July	760	0 (0.0)	0 (0.0)	4 (0.53)	3 (0.39)	0 (0.0)
August	650	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	29 (4.46)
September	468	0 (0.0)	0 (0.0)	2 (0.43)	2 (0.42)	14 (2.99)
October	240	0 (0.0)	0 (0.0)	2 (0.83)	2 (0.83)	16 (6.66)
Total	3027	0 (0.0)	0 (0.0)	10 (0.33)	7 (0.23)	117 (3.86)

Table 2. Frequency and percentage of β-thalassemia minor

Months	Number of couples per month	Thalassemia minor No.	Couples	%
May	666	5	0	0.75
June	243	6	0	2.47
July	760	14	0	1.84
August	650	20	1	3.08
September	468	9	1	1.92
October	240	4	0	1.67
Total	3027	58	2	1.92

Discussion

HBV is the most common cause of serious liver infection in the world⁽¹³⁾. HBsAg was positive in 0.33% of the individuals entered the study; this result was lower than that of Yassin study⁽¹⁴⁾, which was done in Sulaimani city from November 2008 to February 2009, including all premarital people from age 18 years and above of either sex, shows that the prevalence of HBsAg among premarital people was 0.67%. The result of this study was higher than that of Flichman et al. study⁽¹⁵⁾, which study was done in Argentina from 2004 to 2011 including blood donors which showed that the prevalence of HBsAg decreased from 0.336% to 0.198%. In this study, the HCV infection was 0.23%, which is higher than that of Aljarbou study⁽¹⁶⁾,

which was done in Qassim Region of Saudi Arabia in 2008 shows that the HCV was (0.1%) before getting married, and was equal or slightly lower than Alswaidi and O'Brien study⁽¹⁷⁾, which was done in Saudi Arabia in premarital testing between January and May 2008 shows that 0.33% for HCV and lower than Ismail et al. study⁽¹⁸⁾, which was done in March 2014 and continued up to August 2016 in the Public and Family Health Clinic, Tobruk city, Libya where HCV was (1.2%) infections among individuals who performed pre-employment and premarital medical examination. Current study shows that HIV was 0% similar to Ismail et al. study⁽¹⁸⁾ and lower than Alswaidi and O'Brien study⁽¹⁷⁾ who shows that HIV was 0.03%.



This study shown that thalassemia trait prevalence was 1.92%, which is less than a study conducted in Turkey which found to be 2.6 % by Keskin et al. in 2000⁽¹⁹⁾. Among the genetic diseases, the most common disorders are hemoglobinopathies⁽²⁰⁾. B-thalassemia is prevalent in Mediterranean countries⁽²¹⁾. Considering that nowadays, the neighbor Mediterranean countries have eradicated the disease almost completely, Turkish Republic of Northern Cyprus (TRNC), Italy and Greece have succeeded in preventing thalassemia infants being born in the last decade, as a result to society screening, pre-marriage carrier detection⁽²²⁾.

In conclusion, premarital screening program is an important project in detecting asymptomatic carriers of hepatitis viral infection and thalassemia. This study showed that incidence of HBV infections was more frequent i.e., 0.33% (10 cases of HBV infections detected out of 3027 individuals) than HCV infections i.e., only 0.23% (7 cases of HCV infection were detected out of 3027 individuals) and there was no case of HIV infection detected so far, and β-thalassemia trait prevalence was 1.92%.

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Conflict of interest

Author declare no conflict of interest.

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