



Analysis of the Premarital Health Examinations Results of Family Physicians in Isparta: A Retrospective Study

Isparta İlinde Aile Hekimlerinin Yaptığı Evlilik Öncesi Taramaların Sonuçlarının İncelenmesi: Retrospektif Çalışma

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Abstract

Aim: Family physicians, who are the primary providers of health care also perform a premarital examination, which is included in preventive services and required to ensure the continuation of healthy generations. This study was conducted to raise awareness and assess the current situation by analyzing the results of premarital examinations in the province of Isparta.

Material and Method: This is a retrospective, epidemiological, analytical study. The data of 16.181 people who applied to family health centers in Isparta provinces and districts for any reason between the years 2017-2020, were analyzed retrospectively.

Results: As a result of retrospective examination and analysis of premarital examination data of 16.181 people between 2017 and 2020, the average age was 29.70 ± 8.70 , VDRL-RDR was found in 0.2% of the individuals, TPHA in 0.1%, HBsAg in 0.9%, Anti-HBcIgM in 0.03%, Anti-HCV in 0.4%, and Anti-HIV positivity was not detected. Anemia was found in 3.5% of the individuals, and thalassemia carrier was found in 2.2%.

Conclusion: Examinations in the family in the province of Isparta will also be completed in close proximity to family physicians, and premarital examination will be performed. In the training, detailed information was given about emphasizing the repetition of premarital examination by physicians.

Keywords: Premarital examinations, thalassemia, family practice

Öz

Amaç: Birinci basamak sağlık hizmeti sunucuları olan aile hekimleri; koruyucu hizmetler içerisinde bulunan ve sağlıklı nesillerin devamlılığını sağlamak için yapılması gereken evlilik öncesi dönem taramaları da aile hekimleri tarafından yapılmaktadır. Bu çalışma, Isparta ilindeki evlilik öncesi tetkik sonuçlarının değerlendirilip mevcut durumun ortaya konulması amacıyla yapılmıştır.

Gereç ve Yöntem: Çalışmamız retrospektif, epidemiyolojik ve analitik bir çalışmadır. 2017-2020 yılları arasında Isparta il ve ilçelerindeki aile sağlığı merkezlerine herhangi bir sebeple başvuran kişilerin verilerinden evlilik öncesi tarama olarak düşündüğümüz bulaşıcı hastalıklar, hemoglobin ve hemoglobin elektroforezi sonuçları beraber istenen 16.181 kişinin verileri retrospektif olarak incelendi.

Bulgular: Sonuç olarak 2017-2020 yılları arasında ASM başvurusu olan 16.181 kişinin yaş ortalaması $29,70 \pm 8,70$ bulundu. Kişilerin %0,2'sinde VDRL-RDR, %0,1'inde TPHA, %0,9'unda HBsAg, %0,03'ünde Anti-HBcIgM, %0,4'ünde Anti-HCV pozitifliği tespit edilmiş olup Anti-HIV pozitifliği saptanmadı. Kişilerin %3,5'inde anemi, %2,2'sinde talasemi taşıyıcılığı tespit edildi.

Sonuç: Isparta ilindeki aile hekimlerinin evlilik öncesi taramalar konusundaki genel bilgi düzeyleri iyi olarak çıkmış olsa da, evlilik öncesi tarama kapsamındaki istenecek tetkiklerin net bir şekilde düzenlenmesi ve standardizasyonun sağlanması gerektiği, evlilik öncesi süreçte eş adaylarına verilebilecek danışmanlık konularında hekimlere gerekli eğitimlerin dönemsel olarak yapılmasına ihtiyaç olduğu ayrıca verilecek eğitimlerin içeriğinde evlilik öncesi taramalarının hekimler açısından yasal boyutunun da tekrar vurgulanması gerektiği sonucuna ulaşılmıştır.

Anahtar Kelimeler: Evlilik öncesi muayeneler, talasemi, aile hekimliği



INTRODUCTION

Marriage, which we can define as an agreement between two people to create a family, which is the basic unit of society, following specific laws, affects not only the people who get married but also society as a whole.^[1,2] The examination, examination, and consultation of individuals before marriage are necessary to ensure the continuation of healthy generations. Therefore, married couples must receive a premarital health report as stated in 136 of No. 4721 of the Turkish Civil Code and the Regulation on the marriage published in the Official Gazette dated 18921 and numbered 07.11.1985.^[3,4] Family physicians, as primary health care providers, are responsible for examination to inform people, take precautions if possible, and reveal the current risk situation to provide treatment if necessary.^[5] When issuing a health report, a detailed anamnesis should be taken from the person, necessary examinations should be made, in terms of certain infectious diseases, some sexually transmitted diseases, genetically transmitted diseases, blood incompatibility, and psychiatric diseases, and a health report should be given if there is no obstacle.^[2] In addition to observing regional differences, "hemogram, blood group, Anti-HIV, HBsAg, Anti-HCV, Venereal Diseases Research Laboratory (VDRL), Chest X-ray, and hemoglobin electrophoresis" are other tests that may be requested.^[1,6] Diseases such as syphilis, gonorrhea, soft chancre, tuberculosis, leprosy, and psychiatric diseases are situations that may prevent the marriage or require the marriage to be postponed. All necessary information is stated in 122, 123, and 124. item of Law of Umumi Hifzısıhha No. 1593.^[7,8]

In light of all this information, the prevalence of the Isparta province and the results of the premarital examination aimed to determine according to the results of the premarital examination including the years in Isparta province of 2017-2020.

MATERIAL AND METHOD

The research is a retrospective, epidemiological and analytical study. From the data of 23.928 people who applied to family health centers for any reason, obtained from the Provincial Directorate of Public Health in the provinces and districts of Isparta between 01 January 2017- 31 December 2020, the data of 16.181 people who were considered for premarital examination and had all the results of infectious diseases, hemogram and hemoglobin electrophoresis together were analyzed retrospectively.

Statistical analyzes were performed using the IBM Statistical Package for the Social Sciences (SPSS) 26.0 program. Kruskal-Wallis and Mann-Whitney-U tests from nonparametric tests in multiple comparisons in independent groups; Chi-square was used to analyze two or more categorical variables, and Fisher's Exact test was used where necessary. The distribution status of the data was evaluated with the Shapiro-Wilk test. Mean \pm standard deviation for normally distributed data; In non-normally distributed data, median (IQR), expressions indicating frequency were given as numbers and percentages (%). Significance at the 95% confidence interval; $p < 0.05$ was considered significant.

Our study included people aged 16 and over with infectious diseases, hemogram and hemoglobin electrophoresis results. Ethics committee approval was obtained from Süleyman Demirel University Faculty of Medicine Clinical Research Ethics Committee with the number 72867572-050.01.04-638 dated 27.11.2020. In addition, research permission was obtained with the date of 14.01.2021 and the number E-16657963-799 to obtain data from Isparta Provincial Health Directorate and Isparta Public Health Laboratory.

RESULTS

As a result of the analysis, the mean age was 29.70 ± 8.70 (min:16, max:95). Of the applicants, 2 of the 3 16-year-olds and 30 of the 37 applicants got married at the age of 17 were women. While the most common age of marriage application was 24 and 26 for women, it was 26 and 27 for men. This difference was statistically significantly higher in males ($p < 0.01$). 49.3% ($n=7979$) of the subjects were female and 50.7% ($n=8202$) were male. Of the premarital examination tests, 15.1% ($n=2449$) in 2017, 23.9% ($n=3865$) in 2018, 31.2% ($n=5055$) in 2019, 29%, 7 ($n=4812$) were done in 2020. 65.5% ($n=10595$) of the people who applied for premarital examination were in the city center, and 34.5% ($n=5585$) were in the districts. Among the districts, the district with the highest number of applications for premarital examination was Yalvaç, with 10.2% ($n=1647$) (Table 1).

Table 1. Gender, Age averages, where they have been scanned and distributed by the year between 2017-2020

	n	%
Gender		
Female	7979	49.3
Male	8202	50.7
Year		
2017	2449	15.1
2018	3865	23.9
2019	5055	31.2
2020	4812	29.7
Unit Name		
Center	10595	65.5
County	5585	34.5
Aksu	88	0.5
Atabey	197	1.2
Eğirdir	1030	6.4
Gelendost	412	2.5
Gönen	285	1.8
Keçiörlü	380	2.3
Senirkent	336	2.1
Sütçüler	212	1.3
Şarkikaraağaç	822	5.1
Uluborlu	145	0.9
Yalvaç	1647	10.2
Yenişarbademli	31	0.2
	Mean\pmSD	Median (Min-Max)
Age Average	29.70 \pm 8.70	28 (16-95)

A statistically significant difference was found between the years 2020 and 2018 when the change in the genders of the people who applied for premarital examination was evaluated according to years ($p=0.019$). While there was an increase over the years in both genders, a decrease was found in 2020 (**Figure 1**). The reason for this decrease was thought to be Pandemic.

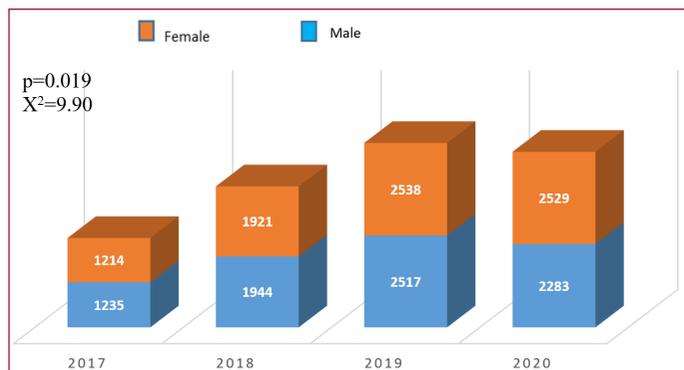


Figure 1. Gender distribution by years of premarital examination

According to World Health Organization data, hemoglobin values are <13 g/dl in men and <12 g/dl in women anemia. In the examination conducted according to these criteria, it was determined that 3.5% (n=567) of the people who had the examination in the city center for premarital examination had anemia, 65.3% (n=370) of them were in the city center, and 34.7% (n=197) were in the districts.

Among those who applied for pre-marriage examination between 2017-2020, CMV, Hepatitis A, Rubella and Toxoplasma infections were also requested to detect, and all 16.181 applicants for pre-marriage examination tested positive for 0.2% (n=38) of the VDRL-RDR study. 13.293 applicants were asked for a T.pallidum Hemagglutination Assay (TPHA) study, and 0.1% (n=13) tested positive (**Figure 2**).

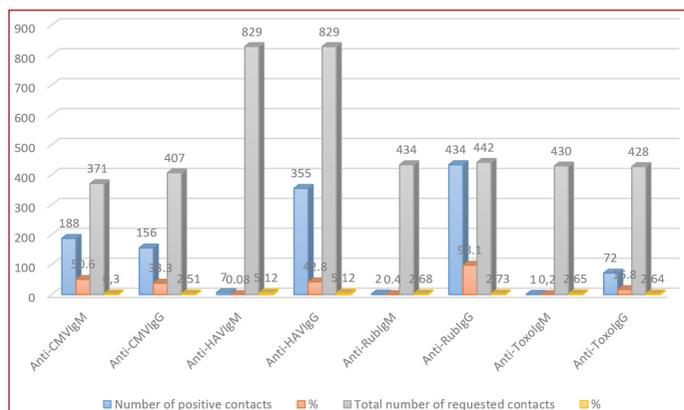


Figure 2. Percentages of Desire and Positivity of Infectious Disease Data Not Routinely Looked at Between 2017 and 2020

As a result of the analysis of the infectious disease tests routinely performed between 2017 and 2020, 0.9% (n=152) of the people tested had HBsAg, 64.8% (n=10493) Anti-HBS,

0.03% (n= 6) Anti-HBc IgM, 5.47% (n=885) Anti-HBc IgG, 0.4% (n=70) Anti-HCV positivity were detected, but Anti-HIV positivity was not present. Anti-HBS level was found to be >10 in 42.6% (n= 6901) of those who were examined, and ≤10 in 48.3% (n=7810).

In order to reveal the prevalence of thalassemia carriage in Isparta using the data between 2017-2020 and how many of these cases were detected by premarital examination, Mentzer index (MCV/RBC) <13 and Red Cell Distribution Width (RDW) index (MCVxRDW/RBC) <220 were evaluated in favor of thalassemia carriage. Since it is not obligatory to ask for iron, TDBC and ferritin in premarital examination, those with iron deficiency anemia were excluded in this way. In the examination performed according to these criteria, thalassemia carrier was considered in 16.1% (n=3855) of the 23,928 people who had data and included everyone for the prevalence estimation. 44.2% (n=1707) of people who were thought to be thalassemia carriers were detected by premarital examination, 11.5% (n=445) of these individuals were female, and 32.7% (n=1262) were male. When HbA2>3.5 was accepted with the Mentzer index and RDW index criteria, thalassemia carrier was detected in 2.2% (n=349) of the screened people (**Table 2**).

Mentzer+RDWI	Female		Male		Total	
	n	%	n	%	n	%
All data	1192	4.98	2663	11.1	3855	16.1
Premarital examination data	445	11.5	1262	32.7	1707	44.2
Mentzer+ RDWI + HbA2>3.5	150/7979	1.9	199/8202	2.4	349/16181	2.2

DISCUSSION

Considering that 487 thousand 270 people were married in 2020 according to the data of the Turkish Statistical Institute, it is understood that approximately one million people a year have pre-marriage examinations, which shows the magnitude of the opportunity and responsibility we have as family physicians to Turkish Statistical Institution data, it is understood that about one million people a year have conducted premarital examinations, which demonstrates the size of opportunity and responsibility we have as family physicians.^[9]

As a result of retrospective examination and analysis of premarital examination data of 16,181 people between 2017 and 2020, the average age was 29.70±8.70, the youngest was 16 and the oldest was 95. In a study conducted by Yıldırım et al. by retrospectively examining the premarital examination data of 290 people, the mean age was determined as 28.2±7.4, the youngest age was 17, and the oldest age was 68 [10]. It is seen that the minimum marriage age determined in our study is not against the law to be 16. In our study, 2 out of 3 16-year-olds and 30 out of 37 people who applied to marry at 17 were

women. The most common ages of marriage application were 24 and 26 years for women, while the ages for men were 26 and 27 years. This difference was statistically significantly higher in men. According to TÜİK 2020 data, the average age of first marriage was 27.9 years for men and 25.1 for women.^[9] In the study conducted by Yıldırım and his colleagues, similar to ours, six of the 17-year-old applications were all women; The most common age of marriage applications in women was 24 and 26 years in men.^[10]

Of the premarital examination examinations performed, in our study 15.1% (n=2449) were performed in 2017, 23.9% (n=3865) in 2018, 31.2% (n=5055) in 2019, and 29.7% (n=4812) in 2020. When we look at the population growth of Isparta since 2017, we see that the increase in marriage examinations from year to year parallels the population growth.^[11]

In our study, where we evaluated the people who applied for the premarital examination, according to WHO data, those with hemoglobin value <13 g/dl in men and hemoglobin value <12 g/dl in women were accepted as anemia. Of the 16,181 people who underwent the examination, 8.5% (n=1374) had anemia, of which 65.3% (n=370) were in the city center, 34.7% (n=197) were the result of district applications, 87.2% (n=1197) of these people were female, and 12.8% (n=177) were male. In the study in which Yıldırım et al. evaluated the people who came for a premarital examination, anemia was detected in 6.2% (n=15) of 241 people,^[10] while in Elkin's study on people who had a premarital examination, the hemogram results of 60 people were examined, and 18.3% (n=11) was found to have anemia.^[1] In a study by Özbacı et al. in 2017 on 1000 people between the ages of 18-65 in Isparta, iron deficiency anemia was determined as 20.3%.^[13] In a study conducted by Yıldırım et al. on 827 elderly patients in Ankara in 2015, anemia was 7.3%.^[10] It is thought that the results found in the studies and the results determined in our study are different due to the age, gender, socioeconomic status, and geographical location of the people included in the study. The fact that the people we included in the study were not people who did not apply on certain complaints but came only for premarital examination purposes may be another reason for the detection of a different anemia rate compared to other studies in our study.

It is observed that some people who applied for premarital examination between 2017-2020 were asked for examinations for the detection of CMV, Hepatitis A, Rubella, and Toxoplasma infections, except for infectious diseases in routine examination tests. The most common positivity was at the CMV IgM level, and positivity was found in 50.6% of those requested. In a study by Tekerekoğlu et al. on fertile women in Malatya in 2003, a positive CMV IgM rate of infectious disease tests was found to be 0.4%.^[14] In the study conducted by Kasap et al. in Muğla/ TURKEY in 2017, Toxo IgM positivity in 3.7% of pregnant and Toxo IgG positivity in 18.8% of pregnant; Rubella IgM in 0.8%, Rubella IgG in 89.5% of pregnant; CMV IgM in 0.3% of 136 pregnant and CMV IgG

positive in 90.4%. It was thought that the low seropositivity for Toxoplasma compared to the general average, the regional variability of seropositivity, and the gradual increase in the refugee population in our country. An examination is recommended because of the lack of effective treatment for Rubella; not all women of childbearing age have yet been vaccinated. For CMV, it has been recommended to limit examination to risky groups only.^[15] In a study conducted by Özgüler et al. in Elazığ with healthcare workers, Anti-HAV IgG positivity was found in 92.4% (n=1572) of 1701 healthcare workers whose hepatitis A tests were evaluated.^[16] In the study by Kutlu et al. with 201 dental faculty students, Anti-HAV IgG was found positive in 24.9% (n=50) of the students.^[19] Although hepatitis A seroprevalence differs depending on factors such as socioeconomic status, age, geographical location, and hygiene conditions, it has a frequency ranging from 8% to 88% in our country, and the result we found in our study was found to be compatible with the rates in Turkey.^[17]

As a result of the analysis of the infectious disease tests routinely performed between 2017-2020, 0.9% (n=152) of the individuals were HBsAg, 64.8% (n=10493) Anti-HBS, 0.03% (n=6) Anti-HBc IgM, 5.47% (n=885) Anti-HBc IgG, Anti-HCV positivity was detected in 0.4% (n=70) of them, and Anti-HIV positivity was not detected. It was determined that the Anti-HBs level was ≤10 in 48.3% (n=7810) of the individuals, and it was concluded that these people needed vaccination. In the study conducted by Yıldırım et al. in 290 people who applied for the premarital examination, Anti-HCV positivity was not found, and Anti-HIV was found positive at 0.7%, HBsAg in 2.4%, and Anti-HBs in 29%.^[10] In the study conducted by Öztürk et al., in 1.7% of 1579 people who came for premarital examination for HBsAg test; Anti-HIV positivity was not detected in 43.1% of 1526 individuals who were requested for Anti-HBS, and 0.2% of 1570 individuals for whom Anti-HCV was requested.^[11] The results we obtained in our study were different from the results found in Turkey. In a study conducted by Demir et al. with 402 healthcare professionals in our province, 3% of the individuals were found to be positive for HBsAg, 58.2% for Anti-HBS positivity, and 20.1% for Anti-HBS and Anti-HBc positivity (natural immunity) and those who are seronegative are 18.6%.^[19] HBsAg positivity was 4%, Anti-HCV positivity was 1%, Anti-HBs positivity was 31.9% in the National Hepatitis Frequency Study (TURKHEP) conducted by the Turkish Association of liver Research.^[22]

VDRL-RDR examination was requested from all 16,181 people who applied for premarital examination, and the test result was positive at 0.2%. TPHA examination was requested from 13,293 applicants, and it was positive at 0.1%. In a study conducted by Öztürk et al. in Istanbul, it was determined that 1565 people were requested to have a VDRL examination and 0.4% (n=6) of them had a positive test. No significant correlation was found between gender and positivity.^[12] While diagnosing syphilis, it was stated that nontreponemal tests are used for examination purposes in the conventional diagnostic

algorithm and should be confirmed with treponemal tests in case of positive results. The reverse algorithm explains that the positivity of a scan performed with a treponemal test should be confirmed by another treponemal test.^[21,22] While similar results were found between Öztürk's study and our study in terms of the syphilis relationship, the rate of positive people in our study was found to be less. This result was thought to be due to regional differences.

In the research conducted with the data between 2017-2020 that we have in terms of anemia examination after infectious diseases; When those with Mentzer index <13 and RDW index >22 were evaluated in favor of thalassemia carriership, thalassemia carrier was considered in 16.1% of 23,928 people. 44.2% of the people who were thought to be carriers of thalassemia were detected by premarital examinations, and 11.5% of these were female, and 32.7% were male. When HbA2>3.5 was accepted together with the Mentzer index and RDW index criteria, thalassemia carrier was detected in 2.2% of the people. There are various studies on the specificity and sensitivity of the Mentzer index and RDW index in the literature. In a study by Kar et al. in 2020, the RDW index was determined as the index with the highest specificity and sensitivity as a distinguishing diagnostic marker of iron deficiency anemia and beta-thalassemia carrier.^[23] In a study by Vehapoğlu et al. in 2014, the Mentzer index was the most reliable index in distinguishing between iron deficiency anemia and beta-thalassemia carrier.^[24] In the study conducted by Öztürk et al. in 2019 with people who applied for premarital examination, thalassemia carrier was detected in 2.2% of 990 people who were asked for hemoglobin electrophoresis. Four of those carriers were identified as females and 18 as males.^[12] In the study conducted with 3324 people who came for premarital examination by Akağaç et al., it was found that 3% of the patients were carriers, the carrier rate in women was 2.45%, and the carrier in men was 3.57%.^[25] In a study by Ulutaş et al., thalassemia carrier was detected in 4.91% of 1994 people who came for premarital examination. Of the remaining 139 people, 7.19% had thalassemia.^[28] In the study by Altıkat et al. in Kütahya, thalassemia carrier was detected in 5.02% of 14,815 people who applied for premarital examination.^[27] In the study conducted with 6054 healthy high school students in Isparta in 2002, thalassemia carrier was detected in 2.5% of them.^[30] Due to autosomal recessive transmission, no gender difference is expected in thalassemia carriers. The prevalence of thalassemia in our country is 2.1%, and the rates vary between 0.6-13% according to regions [8]. Although it is thought that the difference between the studies is because the regions and study groups are different, the rate of 2.2% we found in our study is consistent with the prevalence in Turkey. However, considering there may also be a standard HbA2 valent thalassemia carrier, the rate of 16.1% we found using only Mentzer and RDW index led us to consider whether cases where the HbA2 value is <3.5 can be considered in terms of thalassemia carrier.

CONCLUSION

The examination and positivity rates of infectious diseases, the prevalence of anemia, and thalassemia that we have revealed in the part of our study where the retrospective data are analyzed will contribute scientifically to the literature and show the importance of premarital examinations. However, since these results are reached by selecting the data from the general data obtained from the Public Health Laboratory and analyzing these people considering that they have undergone premarital examination, it suggests that the results cannot be generalized to the whole and that other studies are needed.

While determining the prevalence of thalassemia that we revealed in our study, based on the comparison of the rate of 16.1% of the people we reached by using only the Mentzer index and RDW index to be thalassemia carriers and the rate of 2.2% found by adding the HbA2 >3.5 criteria, it was revealed that there might be more thalassemia carriers. Therefore studies should be carried out on the re-evaluation of the HbA2 criterion.

ETHICAL DECLARATIONS

Ethics Committee Approval: Ethics committee approval was obtained from Süleyman Demirel University Faculty of Medicine Clinical Research Ethics Committee with the number 72867572-050.01.04-638 dated 27.11.2020. In addition, research permission was obtained with the date of 14.01.2021 and the number E-16657963-799 to obtain data from Isparta Provincial Health Directorate and Isparta Public Health Laboratory.

Informed Consent: All patients signed the free and informed consent form.

Referee Evaluation Process: Externally peer-reviewed.

Conflict of Interest Statement: The author has no conflicts of interest to declare.

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