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# Consultation for Internal Diseases During Pregnancy: Why and When

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**ABSTRACT**

The study aimed to examine two key aspects: the frequency of internal medicine consultations and the distinctive characteristics of high-risk fertility among pregnant women attending prenatal care (PNC) follow-ups at a hospital's perinatology clinic, across various trimesters. The study, which was conducted by retrospectively scanning the data of 1829 pregnant women who applied to the perinatology clinic in 2022 and requested internal medicine consultation through the information management system (IMS), was planned as descriptive, exploratory, and analytical. The obstetric characteristics of the pregnant women, the timing of the requested internal medicine consultations, and the reasons for the consultations were examined. The data were evaluated using the SPSS program with a significance level of <0.05. Among the pregnant women, 2% (n=38) had anemia (requiring urgent blood transfusion), 32.5% (n=616) had gestational diabetes, and 97.5% (n=1847) requested consultation due to thyroid-related diseases. 31.9% (n=606) of the women requested consultation for multiple medical indications. The rate of repeated internal medicine consultation was 6.00% in those pregnant women under 40 years of age and 9.20% in those aged 41 and above, with no statistically significant difference observed (p=0.03). When examining the trimesters during which consultation was requested, 13.61% (n=258) were in the first trimester, 17.63% (n=334) were in the second trimester, and 68.76% (n=1303) were in the third trimester, consistent with the gestational age of the women. It was observed that the frequency of internal medicine consultation requests was higher in the pregnant women over 40 years old. The most common reason for consultation was thyroid-related issues, followed by gestational diabetes. Internal medicine consultation was most frequently requested during the third trimester.

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## INTRODUCTION

Pregnancy and childbirth are typically viewed as a physiological process filled with joyous anticipation. However, during pregnancy, disruptions in physiological and biological balance, along with hormonal changes in preparation for pregnancy and postpartum, blur the line between illness and health. Pregnancy and childbirth pose a health risk for women, and pre-existing chronic medical conditions can further exacerbate this risk. Additionally, physical changes that occur during pregnancy can significantly impact existing chronic illnesses (1,2,3).

Every pregnancy and childbirth carries significance in terms of health risks for women. The presence of chronic diseases can further increase these risks. The relationship between maternal and infant mortality and high-risk pregnancies is significant, although some of these risks are preventable (4, 5,6).

In 1993, 44.3% of every 100 pregnancies were classified as high-risk pregnancies, which decreased to 31.1% by 2013. However, it is noteworthy that this declining trend reversed in 2018, with the rate rising again to 35.2% (7,8). In addition to changes in the frequency of occurrence, variations in risks are also observed. While pregnancies with short birth intervals and

adolescent pregnancies have proportionally decreased over time, there has been an increase in the frequency of advanced maternal age pregnancies (5). The increase in the rate of advanced maternal age pregnancies also elevates the risk of high-risk pregnancies, paralleling the likelihood of pregnancy in women with chronic diseases.

High-risk pregnancies encompass material or fetal conditions, as well as those that pose potential risks to the life of the mother, fetus, or newborn. Pre-existing problems or issues that arise after pregnancy begins (such as preeclampsia, placental anomalies, premature rupture of membrane, gestational diabetes, Rh factor incompatibility, risk of preterm birth, etc.) can make the pregnancy high-risk. These conditions may lead to hospitalizations during pregnancy and postpartum and may restrict the activities of pregnant women. In pregnancies of women with chronic diseases, the frequency of complications such as arrhythmia, preterm birth, preeclampsia, congestive heart failure, intrauterine growth restriction, growth retardation, and miscarriage varies between 40% and 70% (1,4,5). High-risk pregnancies are among the most important issues for maternal and child health both in Turkey and worldwide. In 2017, approximately 810 women worldwide died daily from preventable causes related to pregnancy and childbirth (9).

The study aimed to assess the high-risk fertility profiles of those pregnant women receiving prenatal care (PNC) follow-ups at a hospital's perinatology clinic, to investigate the frequency of internal medicine consultation requests, and to identify the specific trimesters during which these consultations were sought.

## METHODS

This research is a retrospective, descriptive, analytical, and exploratory study, and involved an extensive review of records from the hospital information management system (IMS) spanning May to June 2023 to identify internal medicine consultations requested by the pregnant women during their prenatal care (PNC) follow-ups at the perinatology clinic of a city hospital's obstetrics and gynecology department in 2022. The study population consisted of 2,355 pregnant women who attended perinatology clinic appointments and sought internal medicine consultations during the specified period. From this population, a sample of 1,829 pregnant women was selected for inclusion in the study, as their data were meticulously filled out by the researchers in the IMS. The data were obtained from the IMS after obtaining necessary institutional permissions and subjected to thorough analysis. Extracted information included the gestational week of internal medicine consultation requests, reasons for consultation (such as diabetes, thyroid issues, hypertension, preeclampsia, etc.), demographic characteristics of pregnant women (age, obstetric features, height, weight, etc.), vital signs recorded during antenatal monitoring, and screening for anemia – a routine procedure for all pregnant women – through the analysis of hemogram results.

### Statistical analysis

Descriptive statistical analysis encompassed the utilization of frequency and percentage for categorical variables, while mean, standard deviation, skewness, and kurtosis were employed for continuous variables within the study dataset. The normality of continuous data distribution was assessed through histograms and the Shapiro-Wilk test. Differences were investigated utilizing the Kruskal-Wallis H Test and the Mann-Whitney U Test, particularly in instances of nonparametric data distribution. The reported findings included a confidence interval of 95% and statistical significance set at $p<0.05$.

## RESULTS

The data of the 1829 internal medicine consultations requested from the pregnant women who applied to the perinatology clinic between January and December 2022 were included in the study. The ages of the pregnant women ranged from 18 to 51, with a mean of 31.19±6.09 (median: 30). When examining the distribution of the pregnant women according to age groups, it was found that 17.89% were in the 21-25 age range, while 31.08% were aged 35 and above. Among the 589 pregnant women aged 35 and above, the distribution was as follows: 65.87% were aged 35-39, 31.75% were aged 40-44, 2.21% were aged 45-49, and one patient was aged 51. The average gestational week was 29.38±9.97 (Median: 35), and 1% (n=19) of the pregnancies were found to be twin pregnancies. It was observed that 3.5% (n=66) of the pregnant women did not visit our hospital's internal medicine clinics for the requested consultation.

**Table 1.** Reasons for internal medicine consultation by trimester [n (%)].

| | Patient Information Available (n=1829) | Thyroid | Diabetes mellitus | Anemia | Other | Ferinject |
|---|---|---|---|---|---|---|
| **1st Trimester** | 246 | 239 (97.15) | 44 (17.89) | 3 (1.22) | 2 (0.81) | 0 (0) |
| **2nd Trimester** | 325 | 310 (95.38) | 125 (38.46) | 6 (1.85) | 0 (0) | 0 (0) |
| **3rd Trimester** | 1258 | 1234 (98.09) | 422 (33.55) | 29 (2.31) | 1 (0.08) | 3 (0.24) |

**Table 2.** HGB-HCT-erythrocyte distribution by trimester.

| | N | Minimum | Maximum | Mean | SD | Skewness | Kurtosis |
|---|---|---|---|---|---|---|---|
| **Trimester - 1** | | | | | | | |
| **HGB** | 236 | 7.10 | 15.30 | 11.51 | 1.58 | -0.35 | -0.20 |
| **HCT** | 236 | 23.20 | 45.40 | 34.62 | 4.31 | -0.26 | -0.24 |
| **Erythrocyte** | 230 | 0.23 | 409.00 | 11.62 | 45.88 | 6.83 | 52.29 |
| **Trimester - 2** | | | | | | | |
| **HGB** | 312 | 7.10 | 14.50 | 11.10 | 1.53 | -0.32 | -0.44 |
| **HCT** | 312 | 21.30 | 42.90 | 33.45 | 4.38 | -0.16 | -0.47 |
| **Erythrocyte** | 308 | 0.23 | 409.00 | 12.64 | 48.86 | 6.31 | 44.45 |
| **Trimester - 3** | | | | | | | |
| **HGB** | 1221 | 6.50 | 15.80 | 11.04 | 1.60 | -0.16 | -0.42 |
| **HCT** | 1221 | 20.80 | 46.10 | 33.46 | 4.46 | -0.10 | -0.31 |
| **Erythrocyte** | 1210 | 0.23 | 409.00 | 13.66 | 55.22 | 5.97 | 37.00 |

| | Trimester | N | Mean Rank | Chi-Square* | p | | Z* | p |
|---|---|---|---|---|---|---|---|---|
| | 1 | 236 | 1016.58 | | | Trimester 1 vs. 2 | -3.05 | 0.002 |
| **HGB** | 2 | 312 | 883.95 | 18.63 | 0.0001 | Trimester 1 vs. 3 | -3.05 | 0.002 |
| | 3 | 1221 | 859.84 | | | Trimester 2 vs. 3 | -0.58 | 0.564 |
| | 1 | 236 | 1001.80 | | | Trimester 1 vs. 2 | -4.30 | 0.000 |
| **HCT** | 2 | 312 | 866.02 | 14.24 | 0.001 | Trimester 1 vs. 3 | -3.71 | 0.000 |
| | 3 | 1221 | 867.28 | | | Trimester 2 vs. 3 | -0.80 | 0.422 |
| | 1 | 230 | 896.10 | | | Trimester 1 vs. 2 | -0.76 | 0.450 |
| **Erythrocyte** | 2 | 308 | 875.06 | 0.66 | 0.719 | Trimester 1 vs. 3 | -0.05 | 0.963 |
| | 3 | 1210 | 870.25 | | | Trimester 2 vs. 3 | -0.18 | 0.860 |

*Kruskal Wallis H Test ** Mann Whitney U Test. SD: Standard deviation, HGB: Hemoglobin, HCT: Hemotocrit.

The average number of pregnancies was found to be 3.31±0.94 (Median: 2), while the average number of miscarriages was 1.52±0.80 (Median: 1), and the average number of living children was 1.8.

At each follow-up visit to the prenatal clinic, women have their vital signs and weight measured, and, if needed, tetanus immunization is administered according to their gestational age by midwives and/or obstetrics nurses. Moreover, they are introduced to the hospital's prenatal education program, where individual counseling is tailored to their specific needs. However, it was noted that only 10% of the 1895 pregnant women in our sample, who were identified as high-risk pregnancies and requested internal medicine consultation, enrolled in the prenatal education program.

The average weight of the pregnant women was 76.85±15.26 (min: 44 - max: 144), and their height was 160.49±5.91 (min: 142 - max: 180).

It was observed that the blood pressure values of the pregnant women at their last antenatal check-ups were 108.98±12.08 for systolic (min: 62 - max: 168) and 67.20±8.36 for diastolic (min: 33 - max: 97). Additionally, their temperature was 36.7±0.5 (min: 36 - max: 37.6), pulse rate was 94.44±12.03 (min: 11 - max: 137), and respiratory rate was 98.77±1.03 (min: 93 - max: 100). The evaluation of blood pressure values revealed that diastolic blood pressure exhibited a normal distribution, whereas systolic blood pressure did not.

Among the pregnant women, 2% (n=38) required consultation due to anemia (requiring urgent blood transfusion), 32.5% (n=616) due to gestational diabetes, and 97.5% (n=1847) due to thyroid-related conditions. Consultation was sought for multiple internal disorders in 31.9% (n=606) of the pregnant women. Analysis of internal medicine consultation requests by age groups revealed varying patterns: 15% of individuals in the 18-25 age group sought consultation, while in the 25-34 age group, the percentage increased significantly to 54%. In the 35-44 age group, 30.3% sought consultation, whereas among those aged 45 and above, the rate notably decreased to 0.7%. The rate of repeated internal medicine consultation requests was 6.00% in the pregnant women under 40 years old and 9.20% in those

aged 41 and above. However, statistically significant differences were not observed in this discrepancy (p=0.03).

When examining the trimesters during which consultations were requested, it was observed that 13.61% (n=258) were in the first trimester, that 17.63% (n=334) in the second trimester, and that 68.76% (n=1303) were in the third trimester, consistent with gestational age.

Among the three trimesters, the pregnant women were most frequently referred for internal medicine consultation due to thyroid-related issues. Consultation requests related to diabetes mellitus (DM) were lower in the first trimester but remained consistent at around 35% in the other two trimesters.

It was observed that the hemoglobin (HGB) and hematocrit (HCT) values in the first trimester were higher, with HGB (11.51±1.58) and HCT (34.62±4.31), compared to the second trimester HGB (11.10±1.53) and HCT (33.45±4.38), as well as the third trimester HGB (11.04±1.60) and HCT (33.46±4.46). The elevation of HGB and HCT values in the first trimester compared to the other two trimesters is statistically significant ($p<0.05$).

## DISCUSSION

It was found that 31.08% of the pregnant women were aged 35 and above, with diastolic blood pressure exhibiting a normal distribution while systolic blood pressure did not. Moreover, 68.76% (n=1303) of the pregnant women were found to be consistent with the gestational age of the third trimester.

Upon examining the reasons for consultation requests, it was noted that thyroid-related indications accounted for 97.5% (n=1847) of the requested consultations. Additionally, it was observed that in 31.9% (n=606) of the consultations, multiple internal disorders were cited as reasons for consultation.

The rate of repeated internal medicine consultation requests was 6.00% in the pregnant women under 40 years old, while in those aged 41 and above, this rate was higher at 9.20%. However, it was found that this difference was not statistically significant (p=0.03).

The statistically significant elevation of hemoglobin (HGB) and hematocrit (HCT) values in the first trimester (HGB: 11.51±1.58, HCT: 34.62±4.31) compared to the second trimester (HGB: 11.10±1.53, HCT: 33.45±4.38) and the third trimester (HGB: 11.04±1.60, HCT: 33.46±4.46) was observed ($p<0.05$).

According to the 2018 Turkey Demographic and Health Survey, the rate of pregnancies among women aged 35 and above is 13.8% (6). The twofold increase observed in this study is attributed to the selection of the sample group from the perinatology clinic.

One of the most common endocrine disorders during pregnancy is thyroid diseases. While hyperthyroidism is rarely encountered in pregnancies, with a prevalence ranging from 0.1% to 0.4%, hypothyroidism is widespread (10). The frequency of gestational hyperthyroidism varies depending on geographical regions. The examination of different study results reveals that the incidence of gestational thyrotoxicosis ranges from 2% to 3% in Europe during the 8th and 14th weeks of pregnancy, whereas it is much higher among Asian women, reaching 11% (10, 11).

According to a multicenter study conducted in India with 2599 pregnant women throughout all three trimesters in 2016, the incidence of hypothyroidism was determined to be 13.3% (12). In a study conducted in the United States involving 500,000 pregnant women, the frequency of hypothyroidism was found to be 15.5%. Additionally, a prospective study in Sydney with 1069 pregnant women reported an incidence of 9.6% (13, 14).

In a study involving 100 pregnant women with thyroid dysfunction, with gestational age ranging from 4 weeks to 38 weeks, who presented to the Endocrinology and Obstetrics outpatient clinic in Turkey, it was found that 56% of patients (n: 56) sought care in the 1st trimester, 17% (n: 17) in the 2nd trimester, and 27% (n: 27) in the 3rd trimester. In the 1st trimester, 46 patients (56.7%) were diagnosed with subclinical hypothyroidism, while 4 patients (57.1%) were classified as having clinical hypothyroidism. In the 2nd trimester, 12 patients (14.8%) had subclinical hypothyroidism, while 1 patient (14.2%) was diagnosed with clinical hypothyroidism. In the 3rd trimester, 23 patients (28.3%) had subclinical hypothyroidism, while 2 patients (28.5%) were diagnosed with clinical hypothyroidism (11).

In this study, which evaluated the reasons for internal medicine consultation requests among 1829 pregnant women, it was found that thyroid-related issues were the most common reason for consultation in all three trimesters among the pregnant women undergoing follow-up in the perinatology clinic. The study results were determined to be parallel with the literature in this regard. Additionally, in this study, gestational diabetes mellitus (GDM) ranked second as the reason for consultation, with rates of 38.46% and 33.55% in the second and third trimesters, respectively.

According to the TURDEP-I (Turkey Diabetes, Hypertension, Obesity, and Endocrine Diseases Prevalence Study) and TURDEP-II studies conducted in Turkey in 1997 and 2010, involving approximately 25,000 individuals, the prevalence of diabetes mellitus (DM) increased from an average of 7.2% to 13.7% over a period of 12 years (14). According to data from the International Diabetes Federation's Diabetes Atlas published in 2017, hyperglycemia was observed in 6.2% of women who had live births. It is estimated that 93.8% of these cases are gestational diabetes mellitus (GDM), while 6.2% are considered pre-GDM (15).

The combined global standardized prevalence of gestational diabetes mellitus (GDM) is 14.0% (95% confidence interval: 13.97-14.04). In low-, middle-, and high-income countries, the standardized prevalence of GDM is 12.7% (11.0-14.6), 9.2% (9.0-9.3), and 14.2% (14.1-14.2) respectively (16).

Early diagnosis of high-risk individuals can assist in reducing the risk of gestational diabetes mellitus (GDM) and adverse perinatal outcomes through preventive and intervention measures. This study conducted at the perinatology clinic found that consultations for GDM were observed at around 35% during the second and third trimesters. It is recommended that all healthcare providers involved in prenatal care receive

training on the prevention and management of GDM. Providing education to pregnant women on diet, lifestyle changes, weight management, physical exercise, and self-monitoring of blood sugar levels are also crucial aspects for diabetes self-care.

Anemia in pregnancy is a global public health concern. A systematic review and meta-analysis on the prevalence of anemia in pregnant women, including 52 studies with a sample size of 1,244,747 individuals, found that the overall prevalence of anemia among pregnant women was 36.8% (95% confidence interval: 31.5-42.4) (17).

In this study, the rates of internal medicine consultation requests due to anemia for each trimester were determined to be 1.11%, 1.85%, and 2.31%, respectively. The lower rate of internal medicine consultation requests parallel to anemia compared to thyroid issues and gestational diabetes mellitus (GDM) was associated with the pregnant women attending regular antenatal follow-ups and starting iron supplementation in a timely manner.

It was observed that the frequency of internal medicine consultation requests was higher in the women aged 40 and above. The most common reason for consultation requests was found to be thyroid issues, followed by gestational diabetes. Additionally, it was noted that internal medicine consultations were most frequently requested in the third trimester. During each antenatal visit, the pregnant women's vital signs and weight were assessed, and it was observed that diastolic blood pressure exhibited a normal distribution, while systolic blood pressure did not.

When examining the mean hemoglobin and hematocrit levels in each trimester, it was found that, according to the criteria of the Centers for Disease Control and Prevention, anemia was not prevalent in our sample, which was associated with receiving prenatal care.


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## Conflict of Interest

The authors declares no conflict of interest.

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