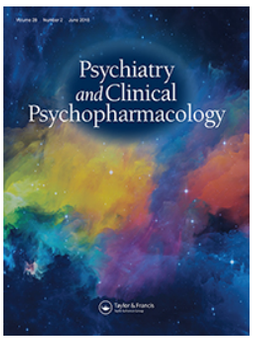

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Impulsivity and impulse control disorders in pregnancy

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ABSTRACT

OBJECTIVE: We investigate the relationship between impulsivity and impulse control disorders (ICDs) in pregnancy. We claim that women with unplanned pregnancies are more impulsive and have a higher frequency of ICDs.

METHODS: We perform a study on the 152 pregnant women who applied to Haydarpaşa Numune Training and Research Hospital Obstetrics outpatient clinic for routine follow-up. The participants are informed about the content of the study and their consents are taken. Socio-demographic characteristics of the participants are recorded. ICDs and impulsivity are assessed by Minnesota Impulse Control Disorders Interview Scale and Barrat Impulsivity Scale (BIS).

RESULTS: ICD was present in 11.8% of the pregnant women ($n = 18$) before gestation and 9.2% ($n = 14$) during gestation. The motor and total impulsivity scores of those diagnosed with ICD during and before pregnancy were higher than those without ICD. The most common ICD during and before pregnancy was compulsive buying (3.3%). The relationship between pregnancy trimester and BIS score is insignificant.

CONCLUSION: The motor and total impulsivity scores of those diagnosed with ICD before and during pregnancy were higher than scores of those not having ICD. It is well-known that ICDs cause not only pschiatric comorbidity but also illegal or high-risk behaviours, interpersonal, social, and economical problems. Thus, early recognition and treatment of ICDs in pregnancies will have a positive effect on both mothers' and babies' health.

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KEYWORDS
Impulsivity; pregnancy; impulse control disorder

Introduction

Although the aetiology is quite complicated, our knowledge about impulse control disorders (ICD) is increasing day by day. In epidemiological studies of psychiatric diseases in the past years, the prevalence of ICD seems to be lower than expected [1–3]. This is due to the use of different ICD diagnostic criteria and the fact that some ICDs are not considered in studies. In the light of new information gained over the years, ICDs had to be approached with a very different perspective in DSM-V (Diagnostic and Statistical Manuel of Mental Disorders-fifth edition). Intermittent explosive disorder (IED), kleptomania, pyromania, pathological gambling, and trichotillomania were involved in DSM-IV-TR (Diagnostic and Statistical Manuel of Mental Disorders-fourth edition-revised) as unclassified ICDs category which was removed in DSM-V and the disorders included were shifted to other diagnostic categories [4,5]. For example, IED, kleptomania, and pyromania are included in "destructive, impulse control and behavioral disorders." "Pathological gambling" has been changed to "gambling disorder" and it has been deemed appropriate to be included in addictive disorders. Trichotillomania was included in the category of obsessive–compulsive and related disorders.

Researchers have been wondering about the frequency of ICD in very different groups. For example, in a study conducted in our country, it was seen that the comorbid diagnosis of ICD (ICDs not otherwise specified were included) was observed in 22.4% of the patients aged 60 years and over [6]. 56.7% of the patients with a depressive disorder were identified as having ICD (when ICDs unspecified were included) [7]. Although it is known that ICDs start in late adolescence and early adulthood, the number of studies accomplished in these groups is very limited. In some studies conducted in the past years, the incidence of any ICD in the last year was found to be 8.9% in the normal population and the lifetime prevalence was determined as 24.8% in the same study. When the distribution of ICDs by age groups is examined, it is determined that the prevalence in the 18–29 age group is higher than other age groups [1,2]. The frequency of ICD was found to be 3.5–10.4% in college students [8,9].

The presence of any ICD was found to be 24.3% in a study conducted by the university preparatory class

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students in our country [10]. However, in a study that investigated ICD in medical school students in our country recently, the frequency of any ICD among female students was 10.1% [11].

In the past, attention was drawn to the relationship between many psychiatric disorders and cyclic hormonal changes. Hypotheses have been produced that menstruation and pregnancy are related to the onset or worsening of psychiatric symptoms and signs. Despite the fact that there are more studies on the change in the course of affective disorders and Obsessive Compulsive Disorder (OCD) with menstrual cycle and pregnancy, studies in the ICD field are very rare. There is only one research on the change of trichotillomania with menstruation and pregnancy which is thought to be in the OCD and related disorders category [12].

In this study, we aimed to explore the rates and characteristics of ICDs in pregnant women and the relation of ICD with pregnancy in a tertiery clinic in a metropolitan city in Turkey. Our main hypothesis for the study is that women with unplanned pregnancies are more impulsive and have a higher frequency of ICDs.

Method

We performed an investigation on 152 pregnant women who applied to Haydarpaşa Numune Training and Research Hospital outpatient clinic for pregnancy follow-up. The participants were educated at least at primary school level. The ages of the participants were between 18 and 45 and their periods in pregnancy were not taken into consideration. Participants were enrolled consecutively and there was no other sampling process. Those with low educational level, those suffering from any psychotic disorder, or those who refused to take part in the study were excluded.

We performed interviews with the participants that fit the conditions that we mentioned above in order to give information about the study and collect sociodemographic data. At the end of the interviews, written consent forms that ask agreement to participate in the study were provided. We only collected the data of the participants that gave written consent to be included in the study. The interview durations were one hour on average.

We planned our study according to DSM-IV, because, as we mentioned above the ICD group in DSM-V is divided and we would like to investigate the frequency of this group in our study. All diagnoses under ICDs not otherwise specified were recorded separately in our data form. Axis I psychiatric diagnoses were made by using a structured clinical interview (SCID-I) for DSM-IV axis I disorders [13]. During the interview with the participants, the Turkish version of the Minnesota Impulsive Disorders Interview (MIDI) was applied in order to detect lifetime ICDs. Whether ICD existed prior to pregnancy or it was present during pregnancy was asked separately. It is also asked whether the current pregnancy was planned. By means of planned pregnancy, it is meant to intentionally terminate the contraceptive method that is being continued to have a baby.

In the second phase of the study, Barratt's Impulsivity Scale (BIS) was administered to the subjects to assess their impulsivity levels [14]. Ethics approval was taken from the ethics committee of Haydarpaşa Numune Training and Research Hospital for the study.

Structured clinical interview for DSM-IV axis I disorders

SCID-I is a structured clinical interview applied by the interviewer to investigate the diagnosis of Axis-I psychiatric disorders. It consists of six modules. The application lasts 30–60 minutes on average. It has been developed by First et al. [15]. Turkish validity and reliability study was done by Özkürkçügil et al. [13].

Minnesota impulse control disorders interview scale

MIDI is a semi-structured interview consisting of 36 items with separate modules investigating the presence of ICDs (e.g. pathological gambling, IED, trichotillomania) according to DSM-IV [16].

Barratt's impulsivity scale

BIS is a self-reported scale using a 3-factor impulsivity model that includes both motor and cognitive impulsivity. It has 30 items measuring impulsivity on 3 subscales including attention, motor, and non-planning [17]. After the evaluation, four different scores are obtained as total (BISt), non-planning (BISnp), attention (BISa), and motor (BISm) impulsivity. Turkish validity and reliability were assessed by Güleç et al. [14]. It has similar psychometric properties as the original.

Statistical tests

For comparison of two independent and normally distributed variables Student's *t*-test was used and to compare two independent and non-normal distributed variables the Mann–Whitney *U* test was used.

One-way ANOVA test was used to compare two independent continuous variables. The Kruskal–Wallis test was used to compare two continuous variables in non-normal distribution. Pearson correlation analysis for correlation of two normally distributed variables and Spearman's rho correlation analysis for correlation

of two continuous variables with non-normal distribution were performed.

Statistical significance level was determined as 0.05. Analyses were performed using MedCalc Statistical Software version 12.7.7 (MedCalc Software bvba, Ostend, Belgium; http://www.medcalc.org; 2013).

Results

Of the 152 pregnant women participating in the study, 27% ($n = 41$) were in the first trimester, 30.9% ($n = 47$) in the second trimester, and 42.1% ($n = 64$) in the third trimester. The mean age of the pregnant women was 28.4 ± 5.7. Mean gestational week was 22.5 ± 11.7 weeks. The number of pregnancies was 2 (min = 1, max = 7). 39.5% of pregnant women had primary school education, 35.5% had high school, and 25.0% had university or above level education. 42.8% were in a job and the remaining 57.2% were not.

66.4% ($n = 101$) of the patients reported that they had not had any psychiatric illness before. Anxiety disorders were found in 11.8% ($n = 18$), major depression in 7.9% ($n = 12$), bipolar disorder in 1.3% ($n = 2$), multiple psychiatric disorders in 7.2%, and the other psychiatric disorders in 5.3% ($n = 8$) of patients.

68.4% ($n = 104$) of pregnancies were planned and 31.6% ($n = 48$) were unplanned pregnancies. 5.9% ($n = 9$) of pregnants women reported smoking while pregnant, while 94.1% ($n = 143$) reported that they did not smoke.

At least one lifetime ICD was present in 11.8% of the pregnancies ($n = 18$). At least one ICD was present before pregnancy in all 18 of them (11.8% of all pregnancies ($n = 18$), and at least one ICD was present during pregnancy in 14 of the 18 pregnancies (9.2% of all pregnancies). The pre-pregnancy diagnoses of the four patients who recovered during pregnancy were as follows; self-mutilation ($n = 2$), pyromania ($n = 1$), and compulsive buying + IED ($n = 1$). No new ICD arose in pregnancy. The distribution of lifetime ICDs is shown in Table 1.

The mean BISnp score was 25.5 ± 4.0, mean BISm score was 21.2 ± 4.5, mean BISa score was 18.8 ± 3.3, and mean BIS score was 65.4 ± 8.7. There was no significant relationship between BIS scores and the gestational week or the number of pregnancies when the relationship between impulsivity and pregnancy was evaluated (Table 2).

There was no statistically significant relationship between pregnancy period and BIS scores (Table 3).

No statistically significant relationship was found between BIS scale scores and pregnancy plan (Table 4). When BIS subscale scores were examined, it was found that there was a significantly higher rate of BISnp subscale scores in the families without psychiatric disease ($p = .016$). Lifetime BISm scores of pregnant women with ICD before or during pregnancy were significantly higher than those without ($p = .007$ $p = .007$ $p = .032$, respectively).

Table 1. Presence and rates of lifetime impulse control disorder.

		n	%
Lifetime ICD	Absent	134	88.2
	Present	18	11.8
Lifetime ICD type	Compulsive buying	5	3.3
	Pyromania	1	0.7
	Intermittent explosive disorder	3	2.0
	Skin picking	4	2.6
	Self-mutilation	3	2.0
	Trichotillomania + intermittent explosive disorder	1	0.7
	Compulsive buying + intermittent explosive disorder	1	0.7

Note: ICD: impulse control disorder.

Discussion

Our study results showed that at least one type of lifetime ICD was diagnosed according to DSM-IV in 11.8% ($n = 18$) of the pregnant women. The most prevalent type of lifetime ICD was compulsive buying (CB) 3.3% ($n = 5$). This was followed by skin picking ($n = 4$) with 2.6%, IED (2%), and self-mutilation (2%) in sequence (Table 1).

CB is an ICD that varies in frequency depending on the content of its description, usually seen in women and starting in late adolescence or the early 20s [18,19]. It is estimated that the frequency of CB is around 6–7% around the world [20]. Little is known about the relationship between CB and gender. Studies conducted in different societies have yielded different data on the frequency of this disorder in women. For example, while in a study conducted in Germany the frequency of compulsive buying in female gender was 6.9%, it was 8.3% (93 out of 1121 women) in a study conducted in Spain [21,22]. In this study, female gender, anxiety, depression, and OCD were considered as the main risk factors for CB [22]. In a study conducted in the U.S.A., the point prevalence of compulsive buying was 6.0% for women [23]. In a study

Table 2. Relationship between BIS scores, gestation week, and gestation number.

		Gestation week	Gestation number
BISnp	*r*	0.012	0.128
	n	152	152
	p	.886	.117
BISm	*r*	−0.154	0.013
	n	152	152
	p	.059	.874
BISa	*r*	−0.106	−0.029
	n	152	152
	p	.194	.727
BISt	*r*	−0.126	0.088
	n	152	152
	p	.123	.283

Notes: BISt: Barratt Impulsivity Scale total score; BISnp: Barratt Impulsivity Scale non-planning score; BISa: Barratt Impulsivity Scale attention score; BISm: Barratt Impulsivity Scale motor score. Spearman's rho $p < .05$.

Table 3. BIS scores with respect to pregnancy trimester.

	First trimester ($n = 41$)	Second trimester ($n = 47$)	Third trimester ($n = 64$)	p
BISnp	25.3 ± 3.7	25.8 ± 3.5	25.4 ± 4.6	.809
BISm	22.1 ± 4.1	21.0 ± 5.3	20.6 ± 4.1	.125
BISa	18.9 ± 3.9	19.4 ± 2.9	18.4 ± 3.2	.138
BISt	66.3 ± 7.5	66.0 ± 8.6	64.3 ± 9.4	.262

Notes: BISt: Barratt Impulsivity Scale total score; BISnp: Barratt Impulsivity Scale non-planning score; BISa: Barratt Impulsivity Scale attention score; BISm: Barratt Impulsivity Scale motor score. ANOVA $p < .05$.

conducted with a group of university preparatory students in Turkey, compulsive buying (18.33%) was found in 22 of 120 female students [10]. The frequency of CB in our study was lower than those reported (3.3%). There may be differences depending on the variability of the diagnostic criteria used, and additional work is needed to determine whether the pregnancy has a CB-reducing effect in women.

In our study, we found that the rate of skin picking disorder was close to that of previous studies (2.6%). The prevalence of skin picking disorder in female university students was 5.8% in a study conducted in the United States. Compared to male students, it was found to be associated with more depressive symptoms in girls [24]. In a study conducted in Turkey, the frequency of skin picking among university students was found to be 2.04% and there was no significant difference in frequency between males and females [25]. In our study, there was no difference (2.6%) in skin picking rates between pre-pregnancy and during pregnancy (2.6%). Pregnant women who did skin picking during pregnancy indicated they did skin picking before pregnancy.

In our study, the rate of IED was found as 2%. In a Japanese study, the lifetime IED prevalence rate was 1.3% for women [26]. In a study conducted with a group of university preparatory students in Turkey, 3 of the 120 female students had an IED (2.5%) [10]. This rate is very close to the rate found in our study.

The lifetime frequency of fire extinguishment, which is considered a sign of pyromania, was found to be 0.4% in females in an American study [27]. In our study, pyromania ratio before pregnancy was 0.7%, but no pyromania was reported during pregnancy. Longitudinal studies should be performed regarding whether the pregnancy reduces pyromania.

Table 4. Relationship between pregnancy plan and BIS scores.

	Planned pregnancy ($n = 104$)	Unplanned pregnancy ($n = 48$)	p
BISnp	25.3 ± 3.7	25.8 ± 4.7	.647
BISm	20.9 ± 4.3	21.6 ± 4.9	.460
BISa	18.9 ± 3.3	18.6 ± 3.3	.352
BISt	65.1 ± 8.4	65.9 ± 9.2	.479

Notes: BISt: Barratt Impulsivity Scaletotal score, BISnp: Barratt Impulsivity Scale non-planning score; BISa: Barratt Impulsivity Scale attention score; BISm: Barratt Impulsivity Scalemotor score. Mann–Whitney U $p < .05$.

In a study conducted with a group of university preparatory students in Turkey, trichotillomania was found in 6 of 120 (5%) female students [10]. In our study, only one patient had a trichotillomania diagnosis, and this patient also had IED.

The non-planning BIS scores being higher in the absence of any familial psychiatric disease is an underestimated finding in previous studies. In a 30-year prospective study investigating the relationship between problem gambling and childhood impulsivity, children with impulsive behaviours at 7 years experienced 3.09 times more gambling problems than those who did not in later years, but the risk did not increase in children with shy/depressive behaviour at 7 years of age [28].

Although there is little consensus on the place of the impulsivity in personality theories, in Barrat's notion of impulsivity, nonplanning and motor impulsivity influence behaviours observed from outside more [29].

The fact that the motor and total impulsivity scores of those with a diagnosis of ICD before and during pregnancy are higher than those without ICD is an expected finding that supports the overlap between impulsivity and ICDs. The presence of lifetime ICD in our study was statistically related to the presence of ICD both before and during pregnancy ($p < .05$ and $p < .05$).

During the study, there was only a slight change in the number of women diagnosed with ICD before pregnancy and the number of women diagnosed with ICD during pregnancy, which was determined according to the oral reports of the pregnant women. Our study results also showed that the rate of comorbid psychiatric disorder was significantly higher in ICD patients ($p < .05$).

In our study, there was no correlation between BIS scores and the number of pregnancies or whether the pregnancy was planned or not, indicating that there is no relationship between impulsivity and pregnancy characteristics (Table 4). Again, lifetime ICD diagnosis appears to be ineffective on its own to predict whether or not the pregnancy is planned.

In a study conducted at Massachusetts, U.S.A. (The United States of America) to test the hypothesis that impulsivity is an important risk factor for unplanned pregnancies 51% of women with a high BIS score report unplanned pregnancies while 25% of those with low BIS scores had unplanned pregnancy [30]. In another study, gambling African-Americans who started sexual activity before the age of 18 and those with a higher impulsivity at age 13 were found to have higher rates of being pregnant or impregnating someone than those who did not gamble [31]. No statistically significant relationship was found between BIS scale scores and unplanned pregnancies in our study.

Despite the fact that our study was cross-sectional, no statistically significant difference in impulsivity scores in different pregnancy trimesters may suggest

that hormonal changes during pregnancy do not significantly affect the course of ICD (Tables 2 and 3). In a single study that retrospectively examined the relationship between pregnancy and hair picking, 50% of pregnant women reported that pregnancy had no effect on hair picking, 50% reported it had [12].

There is a need in the future for studies that prospectively investigate this issue and the relationship between other ICD types and pregnancy. Although our study sample is small in size, it is one of the rare studies in the literature investigating impulsivity in pregnancies. The fact that it was in a metropolitan city like Istanbul enabled the patient diversity representing the sociocultural characteristics of the country at the same time. The strengths of our study are ICD diagnoses are based on structured clinical interviews rather than the notification of the person, and also evaluation of the accompanying axis I diagnoses. The number of cases was limited and the study was not a natural follow-up study. Participants responded to lifetime ICD questions by a recall which could lead to memory bias. Also, direct conversation feature of the study during data collection is another bias that may affect our results. These limitations restrict us in fully investigating the relationship between impulsivity and pregnancy.

Conclusion

Even though the incidence of ICD in the community is higher than that of Bipolar Disorder and Schizophrenia, the prevalence studies of ICD is much lower. Research on ICD epidemiology in different populations is also scarce. As far as we know, this is the first study about the frequency of ICD in pregnant women in our country.

ICDs are psychiatric diseases that are seen quite often in women but are occasionally treated. Besides psychiatric comorbidities, they also cause illegal or high-risk behaviours, problems in interpersonal relationships, social, and economic difficulties in pregnancies. We think that by making screenings in pregnancy early recognition and treatment of them will affect both the mothers' and babies' health positively. For this reason, the recognition and treatment of ICDs during pregnancy is of great importance. We need prospective studies with larger sample size. We think that our work is among the pioneering work in this regard and will be a guide for many studies.

Disclosure statement

No potential conflict of interest was reported by the authors.

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