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Prevalence of Depression among Infertile Couples Attending A Tertiary-Care Infertility Clinic

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Abstract

A large number of people are affected by infertility in their lifetime indicating that this is a major health challenge globally. Although depression has been described as a common consequence of infertility, very little has been documented related to its prevalence and severity, especially in India. This study aimed to assess the prevalence of depression among infertile couples attending a tertiary care infertility clinic.

Method: In this hospital-based cross-sectional study a calculated sample of 126 couples with infertility attending the infertility clinic were consecutively enrolled in the study after obtaining informed consent. Data was collected using an interviewer-administered semi-structured questionnaire and depression was assessed using the Patient Health Questionnaire Depression tool (PHQ9). A couple was considered to have depression if at least one of the partners had depression. Data was analyzed using SPSS version 16. Quantitative variables were expressed as mean and standard deviation and qualitative variables as proportions. Chi-square test of independence and Fisher's Exact Test were used to test the association between categorical variables. Logistic regression analysis explored the association of depression with fertility factors) and with the partner's depression status

Results: The prevalence of depression among infertile couples was 51.6 %(n=65). Depression was more prevalent in females (48.4% n=61) than in males (33.3% n=42) and when the reason for infertility was female-related. However the differences were not statistically significant (p>0.05) There was a significant risk of development of depression when the other partner had depression in both male and female participants (p=0.001, Odds ratio=25.196).

Conclusion: There is increasing concern about whether depression can be the result of a cause for infertility. Many experts opine that depression may interfere with the success of infertility treatment. Females are often blamed for childlessness, especially in rural India resulting in an increased prevalence of depression among infertile females. Counselling methods, especially supportive psychotherapy and interventions to decrease

and prevent the development of severe depression among these patients should be considered

Keywords: Infertility, Depression, Infertile Couples

Introduction

Infertility is experienced as a life crisis with a wide range of physical, psychological, sociocultural and financial problems. More than 80 million people in the world are affected by this problem[1].In general, infertility is found in one in ten couples[2].The World Health Organisation's (WHO) estimates of primary and secondary infertility in India are 3% and 8%, respectively[3,4]. Data extrapolated from WHO by the Indian Council of Medical Research (ICMR) suggest that approximately 13–19 million couples are likely to be infertile in India at any given time [5].

Infertility is a medical and social condition which can cause social, emotional and psychological distress. Psychological factors have an important role in the pathogenesis of infertility [6]. Many studies have provided evidence that depression is highly prevalent among infertile women [7-11].Infertility can affect the quality of relationships and can result in relationship crises in some couples [9]. Duration of infertility may have an effect on the severity of depression in infertile couples. Social isolation, diminished self-esteem, lack of empathy from family and friends, long and uncertain treatment and the costs of treatment are the probable reasons for the negative psychological consequences of infertility [7-11].

Infertility treatment itself may have negative psychological effects; possibly reducing its efficacy Treatments for infertility can result in significant effects on estrogen and progesterone levels. These hormones, through their actions on the neurotransmitter serotonin can influence mood of the woman. On the other hand emotional distress can result in decreased fertility and reduced response to treatment by suppressing ovarian function or implantation. Thus a vicious cycle is created by this interaction between depression and infertile status. This can result in treatment dropouts or treatment failure [9-11].

Addressing the psychological issues during infertility treatment is now considered important because of the increasing awareness that depression could be the cause of infertility, its consequence, or both and may interfere success of infertility treatment and the ability to tolerate ongoing treatment.

Aim of the study

1. To find the prevalence and severity of depression among couples attending the Infertility clinic of the Reproductive Medicine Department of Sree Avittom Thirunal (SAT) hospital, Government Medical College, Thiruvananthapuram, Kerala, India
2. To find any association of depression with fertility factors including cause, type and duration of infertility ,history of previous treatments and history of abortions.
3. To find any association of depression with partner's depression status.

Materials & Methods

A cross-sectional study was done in the Infertility clinic of the Reproductive Medicine Department of Sree Avittom Thirunal (SAT) hospital, Government Medical College, Thiruvananthapuram, Kerala, India. The study population included couples who attended the clinic during the study period- September to October 2019.

A meta-analysis by Masoumiet al[11] showed that nearly 50% of the infertile couples were affected with some degrees of mild, moderate or severe depression. This was used as the parent study to calculate the sample size. Applying this in the formula $(Z\alpha 2\ pq)/d2$ where 'p' is the expected proportion in population based on previous

studies or pilot studies and 'd' is the relative precision of 20 %,the sample size was fixed as 126, after allowing a non-response rate of 5%. (Z= Zα = 1.96 for 95% confidence interval, q= 1-p).Every consecutive couple who attended the infertility clinic and consented to be in the study was recruited till the required sample size was met.

The prevalence of depression and its severity were assessed by the Patient Health Questionnaire-Depression (PHQ9) tool. A couple was considered to have depression if at least one of the partners had depression. The PHQ-9 scores the 9 items of the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV). Scores on each item range from '0'indicating no depressive symptoms to a maximum of '3' indicating severe symptoms. The total score can thus range from 0 to 27. A score of 0 - 4 indicates minimal or no depression, 5 – 9 suggests mild depression, 10- 14 is for moderate depression, 15-19for moderately severe depression and 20-27 indicates severe depression.

An interviewer-administered semi structured questionnaire was used to collect data on study variables like the age of marriage, duration of infertility, type of infertility, cause of infertility, previous history of abortions and previous infertility treatment history.

Data was analyzed using Statistical Package of Social sciences (SPSS) version 16(SPSS Inc. Chicago, IL,USA).Qualitative variables were expressed as proportions and quantitative variables as mean and standard deviation. Chi-square test of independence and Fisher's Exact Test were used to test the association between categorical variables. A p-value of <0.05 was considered statistically significant. Binary and multivariate logistic regression analysis was performed to analyse the risk of association of depression with fertility factors (type, duration and cause of infertility, history of previous treatment and abortions) and with partner's depression status

Ethical Considerations: This study was under taken after obtaining clearance from the Institutional Ethics Committee (HEC No. 08/12/2019/MCT).

Results.

Prevalence of Depression In Infertile Couples

A hundred and twenty-six couples were assessed. Depression was present in 51.6% (n=65) of couples. Out of this 30.2 % (n=20) of couples had depression in both male and female partners, 3.2 % (n=2) had only male partner depressed and 18.3 % (n=12) had only female partner depressed.

Prevalence and severity of depression in male and female partners taken separately

The prevalence of depression in all the males who participated in the study was 33.3 % (n=42) and in females, it was 48.4 % (n=61). 66.7 % (n=84) of male participants and 51.6 % (n=65) of female participants had either a minimal form of depression or no depression when assessed using PHQ 9 scale. None of the male participants had severe depression. Only one female participant had severe depression.

Association of Depression With Fertility Factors Studied

Cause of infertility

In those 45.2 %(2=57) participants where the cause for infertility was known, 27.8 %(n=35) had female cause for infertility,11.9%(n=15) had male cause for infertility and 5.6%(n=7) had both male and female causes for infertility. Prevalence of depression was high in couples who had female cause of infertility (64.9%). But the difference was not significant (p=0.294 Table 1).Logistic regression analysis showed no significant association between the cause of infertility and the prevalence of

depression in male as well as female participants (Table 4)

Type of infertility

69.8% couples had primary infertility. Among couples, males and females with depression, 71.1%,73.8% and 65.6% respectively had primary type of infertility. But the results were not statistically significant. (Table 5)

Duration of infertility, history of previous treatment and abortion.

In participants with duration of infertility >/= 2 years there was increased prevalence of depression (60.5%). But the result was not much significant (Table 6). Similar trend was observed when males (61.9%) and females (65.6%) were considered separately. But the results were not significant (p=0.074 and p=0.118 respectively).There was no significant association with the history of abortions (p=0.738) and prevalence of depression in infertile couples. In our study 62.9% already had some form of treatment. But the prevalence of depression was found to have no significant association with duration of infertility treatment.(Table 4)

Association with partner's depression status

There was significant risk of development of depression in both males and females when the other partner had depression (p=0.001). 62.3 % (n=38) of females had some form of depression when their male partners had depression. In 93.8 % (n=61) of females whose male partners were not depressed had no depression. (Odds Ratio = 25.196) (Table 3)

Discussion

Although depression has been described as a common consequence of infertility, very little has been documented related to its prevalence and severity, especially in India. This might be because those who fall outside the normal range of depression inventories are poorly reported or because the psychological impact of infertility differs from that due to other medical conditions [10].

Some studies show that depression in infertile couples can be related to the fertility factors like type, cause, duration of infertility, previous treatment etc. In India, despite remarkable progress in the field of medical research and technology, certain assisted reproductive techniques, including in vitro fertilization (IVF) and other cutting-edge research and development methods, have raised ethical concerns and have encountered resistance due to factors deeply rooted in cultural, social, and religious traditions. The ongoing debate between those who want stringent regulations to maintain ethical standards and others who would harness the potential of new technologies highlights the need for open dialogues among policymakers, medical professionals, ethical commissions, and the public. The treatment of infertility often costly and involves complex processes and limited success rate. This can increase the psychological burden on infertile couples.

Most of the studies on infertility associated depression enrolled infertile women because of the "global" belief that female partners are psychologically and culturally more vulnerable. Not many studies are there on the association of infertility related depression with the depression status of the partner.

In this study prevalence of depression among infertile couples was found to be 51.6 % (n=65). Out of this 21.5 %(n=27) had depression in either of the partners, (3.2%, n=4) in male partners and 18.3%, n= 23) in female partners. In 30.2 %(n=38) both the partners had some form of depression. These findings are similar to that by Masoumi et al[11]. Chen et al, reported that 40.2% of infertile women develop some form of psychological disorders and 17% had severe depression[12].A cross-sectional study in Nigeria by Upkong et al[13] indicated

that the prevalence of depression in infertile women was 42.9 %. Similar results were reported by Lok et al[14]Ramezanzadeh F et al[15], and Al-Homaidan[16](33%, 40.8%, and 53.8%, respectively). But a study byTuan M Vo[17]showed a lower prevalence of 12.2% probably because only those who visited the hospital for the first time were selected for that study. Those patients might have a better psychological status as they had not experienced treatment failure so far and were therefore more optimistic.

Our study showed that the prevalence of depression was more in females than in males. Of all the males 33.3%(n=42) and of all the females studied 48.4% (n=61) had some form of depression.(Figure 1) A study by Al-Homaidan showed similar results[16]. A meta-analysis by Abate KH[18]showed that the male sex is 63% less likely to develop depression than the female sex and concluded that depression is more common among infertile females than their male counterparts. The author opined that gender had a very important role in defining susceptibility and exposure to several mental health risks. It is estimated that one of the characteristics of infertile couples is that women are habitually more affected by the situation of infertility than men[19]. In the Indian cultural context woman faces the threat of divorce, even if the male factor is the primary cause of infertility. In Kerala, like in other parts of India, children are highly valued for cultural, social and economic reasons. So childlessness often creates significant problems for couples especially for the women who are generally blamed for infertility at least in rural Kerala. The high prevalence of depression in females in the present study could be attributable to the significant societal and family demand to have a biological child.

Our study showed a significant association between the prevalence of depression in the partner when the other partner is depressed (Table 3). This applied to both males and females ($p<0.01$). Depressive symptoms and their consequences are not experienced in isolation. Depression in one spouse leads to occurrence of depression or increase in severity of depressive symptoms of the other spouse over time. Cross-spousal sharing of depressive symptoms can be explained using the stress process model. According to this model stress due to infertility intensifies & accumulates with in persons and manifests as psychological distress resulting in depression. The depressive symptoms in turn proliferate not only *within* the person (in husband or wife) but also between persons, (from spouse to spouse)[20].

Whether men or women are more likely to be affected by their spouses' depressive symptoms as well as the interpersonal process involved in this is not very clear. Logistic regression analysis, with male depression and female depression as the dependent variables, depression in females and males were both positively associated ($P<0.01$ OR 25.196) with male and female depression respectively (Table 4).A study by Thomeer et al reported that wife's depressive symptoms influence her husband's future depressive symptoms but not vice versa[21]. Men are often viewed as emotionally deficient and incompetent than females. So it is generally considered that a woman is capable of providing emotional support for her husband when he is depressed but not vice versa.

Analysis of the severity of depression revealed that in both males and females, a majority had only mild level of depression - 23 % (n=29) in males and 27.8 % (n=35) in females. (Table 2) None of the respondents had severe form of depression. The infertile couples visiting the infertility clinic, SAT Hospital receive routine counseling. This might have helped to reduce the severity of depression in these people.

In this study, 45.2 % (n=57) of couples knew the cause of their infertility. In 27.8 %(n=35) of couples, there was female-related infertility and in 11.9 %(n=15) there was a male cause for infertility. Both male and female factor infertility was diagnosed in 5.6% couples (n=7). In the remaining 54.8 % (n=69) of couples, the cause of infertility was not yet diagnosed or unexplained. (Table 1) The information provided by the couples regarding the cause of infertility was considered for this study. The cause of infertility stated by the respondents was not compared with that documented in the medical records. To find any association between the cause of infertility and depression in male and female partners, participants were divided into 2 groups-group 1 with male cause of infertility (11.9%) and group 2 with female cause of infertility (27.8%).The prevalence of depression was found to be more when the reason for infertility was female-related (64.9% n=82). Depression was found to be less in female patients (27.3%, n=34) when the cause of infertility was due to male factor or if it was a combined cause. But the difference was not statistically significant (Table 4). A similar result was obtained in a study by Al-Homaidan[16] which reported that the depression rate among women who were the cause of infertility was higher than that in women whose husbands were the cause of infertility. This study reported that the risk of development of depression is lower when the male factor is responsible for infertility. This type of behavior has been observed in countries with family-based societies. Some studies[21-23] reported that infertile women experienced higher rates of psychiatric symptoms than their husbands especially when the cause of infertility was related to the female or due to unexplained factors. In our study logistic regression analysis showed no significant association between the cause of infertility and depression in either females or males. (Table 4).

In the present study, 69.8 % (n=88) of couples experienced primary infertility and the remaining 30.2 % (n=38) had secondary infertility. There was no significant difference in the prevalence of depression between those with primary and secondary infertility (Table 5).In a study was conducted to identify psychological distress with different experiences of infertility among women who have experienced infertility within the previous 10 years, two groups of women with infertility were compared:-one who has had a prior pregnancy (secondary infertility) and another group of women with no prior pregnancies (primary infertility). Women with primary infertility who were undergoing infertility treatment stood out as a particularly distressed group. This study emphasized the fact that caregivers should be aware that the emotional needs of women with primary infertility may differ from those with secondary infertility[24].But a survey conducted among women at three health centers in Southern Ghana by Donkor ES et al to identify the relationship between perceived stigma and infertility-related stress revealed that the presence of an existing child/children or the number of years spent in infertility treatment had only very little impact on stigmatization and stress related to infertility[25]. In our study the couples with secondary infertility had a history of unsuccessful pregnancies due to abortions. None of them had live children. This could be the reason for the similar prevalence of depression in both groups.

In our study most of the infertile females (54.8%, n=68) belonged to age group of 20-29 years and most of the males (63.2%, n=79) belonged to the age group 30-39 years (Table 5). Prevalence of depression was high in males as age increased. But in females prevalence of depression was low in the group >30 years. But the result was not significant in both males (p=0.725) and females (p=0.353) .This might be because age of majority of the

females who participated in the study and the age of marriage of females in the study were below 30 years. Due to increased number of participants below 30 years the prevalence of depression was also found high below 30 years. In males the age of majority of the participants was above 30 years. Due to increased number of participants above 30 years the prevalence of depression was also found high above 30. In a study by Al-HomaidanHT[16] as age increased, participants exhibited a greater tendency towards depression. It is estimated that female fertility peaks around the ages of 26-35 years and infertility becomes more pronounced after the age of 35. This knowledge that their fertility will be declining as age advances results in psychological pressure which could have contributed to this high depression as observed in the present study.

In our study, 28 % (n=35) of the couples recognized their fertility problem within 2 years after marriage and 62.9 % (n=79) already had some form of treatment. The duration of infertility treatment was less than 1 year in 13.6 %(n=17) of couples. Most of the couples studied (60.5%, n=76) developed some form of depression when the duration of infertility treatment was >2 years. But in our study, the prevalence of depression in infertile couples was found to have no significant association with the age, duration of infertility and history of abortions or previous infertility treatment. (Table 6) This finding is different from the result of a study by Ramezanzadeh[25] which observed that depression increased with the duration of infertility. In a study by Lata I et al Depression was more in infertile women having married life for more than fifteen years[27].At the early stage of infertility, mental stress and depression would be low due to an increased level of hopefulness about the results of medical interventions. With the increased duration of infertility and repeated treatment failures, infertility would gradually change to a chronic problem resulting in monthly cycles of hope and hopelessness in infertile couples. But a study by Al-Homaidan[16] reported that infertile patients who had infertility for an intermediate to a long time showed fewer symptoms than those who are in the first stage of their problem. The authors suggested that as the duration of infertility increases the psychological stress and severity of depression in affected people decreases but would never disappear. The researcher found that depression peaked between the second and third year of infertility and did not return to the normal range until after 6 years of infertility. The study also reported that women with 2–3 years of duration of infertility suffered from more depression compared with those who experienced less than one year of infertility [16].

Table 1: Clinical Details of Infertility

Variables	Frequency(%)
Duration of infertility (years)	
0-2	35(28%)
2-5	33(26.4%)
5-10	41(32.8%)
>10	16(12.8%)
Type of infertility	
Primary	88(69.8%)
Secondary	38(30.2%)
Cause of infertility	
Unknown(under evaluation)	69(54.8%)
Known	57(45.2%)
Regarding couples with cause of infertility is known	
Infertility due to male cause	15(11.9%)
Infertility due to female cause	35(27.8%)
Infertility due to both male and	7(5.6%)

female cause	
Previous treatment history	
No	46(6%)
Yes	78(62.9%)
Previous history of abortions	
No	94(76.4%)
Yes	29(23.6%)

Table 2: Severity of Depression

Variable	Females	Males
Severity of depression		
Minimal %(n/N)	51.6(65/126)	66.7(84/126)
Mild%(n/N)	27.8(35/126)	23(29/126)
Moderate%(n/N)	17.5(22/126)	8.7(11/126)
Moderately severe % (n/N)	2.4(3/126)	1.6(2/126)
Severe%(n/N)	0.8(1/126)	0(0/126)

Data are presented as % (n/N), "n" refers to the number of cases and "N" refers to the total number.

Table 3: Association of Depression with Partner's Depression Status

		Male depression			Chi-square value	P value
		No	Yes	Total		
Female depression	No	61/93.8%	4/6.2%	65(100%)	44.632	0.000
	Yes	23/37.7%	38/62.3%	61(100%)		
Total		84/66.7%	42/33.3%	126(100%)		
		Female depression				
		No	Yes	Total		
Male depression	No	61/72.6%	23/27.4%	84(100%)	44.632	0.000
	Yes	4/9.5%	38/90.5%	42(100%)		
Total		65/51.6%	61/48.4%	126(100%)		

Data are presented as n/% where "n" is the number of cases.

Table 4: Multivariate Analysis of The Risk Factors With Depression In Infertile Couples

Variables	Female depression		Male depression	
	Adjusted OR(95% CI)	p-value	Adjusted OR(95% CI)	p-value
Type of infertility	0.775(0.211-2.852)	0.702	0.687(0.171-2.763)	0.597
Male cause for infertility	0.679(0.226-2.035)	0.489	1.389(0.459-4.201)	0.561
Female cause for infertility	0.861(0.394-1.881)	0.707	0.400(0.158-1.013)	0.053
Duration of infertility(years)	0.940(0.861-1.026)	0.164	0.936(0.225-4.137)	0.184
History of abortions	2.222(0.568-8.696)	0.251	0.965(0.848-1.032)	0.961
Male partner depressed	25.196(8.087-8.499)	0.000	-	-
Female partner depressed	-	-	25.196(8.087-78.499)	0.000

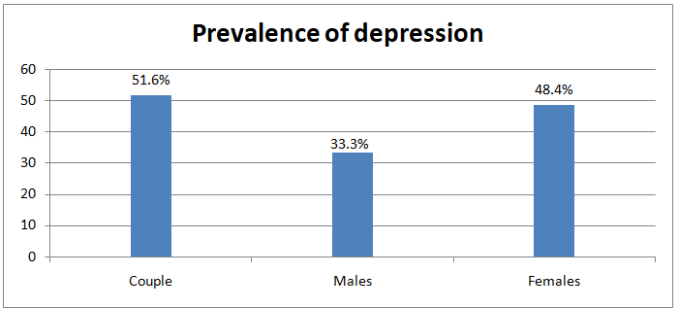
Table 5: Association of Depression with Fertility Factors

Characteristic	Depression	No Depression	Chi square test	p value
A. Type of infertility				
Couples				
Primary infertility	27(71.1)	61(69.3)	0.038	0.846
Secondary infertility	11(28.9)	27(30.7)		
Males				
Primary infertility	31(73.8)	57(67.9)	0.471	0.493
Secondary infertility	11(26.2)	27(32.1)		
Females				
Primary infertility	40(65.6)	48(73.8)	1.022	0.312
Secondary infertility	21(34.4)	17(26.2)		
B. Duration of infertility in years				
Couples				
<2	15(39.5)	20(69.3)	3.565	0.059

>=2	23(60.5)	27(30.7)		
Males				
<2	16(38.1)	19(22.9)	3.198	0.074
>=2	26(61.9)	64(77.1)		
Females				
<2	21(34.4))	14(21.9)	2.441	0.118
>=2	40(65.6)	50(68.1)		
C. Age				
Males				
<30	7(16.7%)	12(14.3%)	0.124	0.725
>=30	35(83.3%)	72(85.7%)		
Females				
<30	36(59%)	33(50.8%)	0.864	0.353
>=30	25(41%)	32(49.2%)		

Data are presented as n/% where " n" is the number of cases

Figure 1



[a] There was a significant difference between the prevalence of depression in females ad that in males ($p<0.01$)

Limitations of the study

Since the study was done in a limited area it may not necessarily reflect the characteristics of the general population.

Due to the cross-sectional design, causal relationships could not be established between depression and variables related to infertility and its treatment.

Conclusion

In conclusion, the prevalence of depression among infertile couples is high, especially among infertile women. The high prevalence of depression in females in the present study could be attributable to the significant societal and family demand to have a biological child. Childlessness creates significant problems for couples; especially for the women who are generally blamed for infertility. Prevalence of depression was found to be more when the reason for infertility was female-related. Counseling methods, especially supportive psychotherapy and interventions to decrease and prevent the development of severe depression, among these patients should be considered

Recommendations

It is postulated that the psychological state of infertile couples can affect treatment outcome.Efforts should be taken to educate people about infertility so that there is less pressure on infertile couples. Psychological and psychiatric services associated with infertility treatment centers will undoubtedly facilitate the treatment by reducing the psychological problems of infertile couples and their families

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