

# Infertility and Weight Reduction: Influence and Outcome

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## ABSTRACT

**Objective:** To assess the effect of weight reduction in obese infertile women on conception rate spontaneously as well as with ovulation induction and pregnancy outcome.

**Study Design:** Observational experimental study.

**Place and Duration of Study:** Different private clinics at Mirpurkhas, Thana Bola Khan and Hyderabad, Sindh, Pakistan, from March 2008 to February 2011.

**Methodology:** Infertile women who were obese with the body mass index (BMI) > 30 kg/m<sup>2</sup> and failed to conceive within 2 – 5 years after taking treatment of infertility for many cycles were inducted. These women underwent life style change program related to exercise and diet for 6 months and in the next 6 months they were observed for spontaneous conception. Those women who failed to conceive were prescribed ovulation induction (clomifene citrate) for the next 6 months and were observed for conception. After conception, they visited regularly during antenatal period till delivery. The data was collected and analyzed on SPSS version 17.

**Results:** The mean decrease in the body index observed was  $9.6 \pm 1.23$  kg/m<sup>2</sup>, spontaneous conception rate was (n = 35, 41.17%) and miscarriage rate was (n = 9, 16.66%).

**Conclusion:** Weight reduction leads to high spontaneous conception rate as well as with ovulation induction therapy and improves the pregnancy outcome.

**Key Words:** Obesity. Infertility. Weight reduction. Conception rate. Pregnancy outcome.

## INTRODUCTION

Obesity contributes to an ovulation and menstrual irregularities, reduced conception rate and a reduced response to fertility treatment. It also increases miscarriage and contributes to maternal and perinatal complication. Reduction of obesity, particularly abdominal obesity, is associated with improvements in reproductive functions; hence, treatment of obesity itself should be the initial aim in obese infertile women before embarking on ovulation-induction drugs or assisted reproductive techniques. While various strategies for weight reduction, including diet, exercise, pharmacological and surgical intervention exist, lifestyle modification continues to be of paramount importance.<sup>1</sup> Obesity and excess weight are major chronic disease in western world countries.<sup>2</sup> Childhood obesity leads to increased obesity-related sub-fertility in future.<sup>3</sup> The rising prevalence of obesity has had a profound impact on female reproductive health. Increased body mass index (BMI) is associated with ovulatory sub-fertility and ovulatory infertility.<sup>4</sup> The strongest obesity-related effect

on fertility is anovulation.<sup>5</sup> Polycystic ovarian syndrome (PCOS), the most noted cause of anovulation, is further exacerbated by increased insulin resistances and hyperinsulinemia associated with being overweight and obesity.<sup>6</sup> Recently published studies revealed that infertility affects about one in six couples during their lifetime and is more frequent in obese.<sup>7</sup> Obese women, even with ovulatory cycle, have a lower chance of spontaneous conception,<sup>8</sup> while obese infertile women with anovulatory cycle have low ovulation rates with ovulation induction therapies.

Overweight and obesity is common in women of reproductive age, many of whom are choosing to delay child bearing, thus creating a need to balance the detrimental effects of age versus BMI on fertility and perinatal outcomes.<sup>9</sup>

Obesity also increases the miscarriage rates and contributing to maternal and perinatal complications.<sup>10</sup> Life style factors have been shown to affect fertility in both males and females, overweight impairs natural and assisted fertility.<sup>11,12</sup>

Excessive weight gain results from lack of exercise, changing habits of dietary composition as well as intake and various endocrinopathies associated with polycystic ovarian syndrome.<sup>13</sup>

The aim of this study was to observe the effects of weight reduction on spontaneous conception rate and with ovulation induction therapies in obese overweight infertile women.

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## METHODOLOGY

This experimental study was conducted at different private clinics at Mirpurkhas, Thana Bola Khan and Hyderabad, Sindh, Pakistan, from March 2008 to February 2011. Those women who had taken treatment of infertility for 2 – 5 years and failed to conceive, having body mass index (BMI) > 30 kg/m<sup>2</sup> were included in the study, while those infertile women with other known aetiological factors and BMI ≤ 30 kg/m<sup>2</sup> were excluded. These women were made to stop conventional medical treatment for infertility during the study period. Ninety eight women who met the inclusion criteria were approached with an informed written consent. These women underwent fortnightly program of life style change related to exercise and dietary habits for 6 months, and then were followed monthly for next 6 months for spontaneous conception. Those women who failed to conceive, were prescribed clomifene citrate for ovulation induction for the next 6 months, and were followed monthly till they conceived. These women had regular antenatal check up monthly till 30 weeks of pregnancy then fortnightly for 37 weeks and then weekly till delivery. The data was collected and analyzed on Statistical Package for Social Sciences (SPSS) version 17. Studied variables were demographic characteristic like age, infertility duration, previously infertility treatment cycles, body mass index, change in body mass index, conception spontaneously or with ovulation induction, maximum duration for conception, pregnancy outcome like miscarriages, preterm labour, full term pregnancy with live birth. The values were calculated for qualitative type of data analyses by applying Chi-square test for spontaneous conception rate without treatment, conception rate with ovulation induction therapy and no conception at all after weight reduction, p-value < 0.05 was considered as significant.

## RESULTS

Ninety eight women registered for the study were having the age mean±SD 31.06 ± 2.48 years. Their body mass index was mean±SD (36.21 ± 1.35 kg/m<sup>2</sup>), infertility duration was mean±SD 4.60 ± 0.68 years, previously infertility treatment was 5.58 ± 1.25 received for cycles. Out of the 98 registered women, 85 had regular active participation throughout the study period and 13 dropped out on their request. The mean change in body mass index was 9.6 ± 1.23 kg/m<sup>2</sup>. Out of 85 active participants, 35 (41.17%) women had spontaneous conception (p = 0.569); 19 (22.35%) women conceived with ovulation induction therapy and 31 (36.47%) women failed to conceive at all (Table I). Pregnancy outcome was full term live birth in 32 (59.25%) women, preterm birth in 13 (24.07%) women and miscarriage in 9 (16.66%) women.

**Table I:** Frequency of conception with and without treatment and in relation with maximum time period (n = 85).

Conception rate	Maximum period				p-value
	1 - 3 months	4 - 6 months	7 - 9 months	10 - 12 months	
Spontaneous (without treatment) 35 (41.17%)	16 (45.71%)	19 (54.28%)	-	-	0.569
With ovulation induction 19 (22.35%)	-	6 (31.57%)	-	13 (68.42%)	0.088
No conception 31(36.47%)	-	-	-	-	-

## DISCUSSION

Obesity affects the health generally and has great influence on reproductive health. In this study, out of the 85 active participants, the mean decrease in body mass index was 9.6 ± 1.23 kg/m<sup>2</sup>. In these women, the main strategy adopted for weight reduction was life style change for dietary habits and exercise and not much attention was given on caloric restriction. This was compared with Galletly *et al.* study,<sup>14</sup> where the mean change in weight was 6.2 ± 4.5 kg/m<sup>2</sup>. Clark *et al.* reported an average weight loss of 10.2 kg/m<sup>2</sup>.<sup>15</sup> In both these studies, the same policy was adopted for weight reduction; less emphasis was given on caloric restriction and main efforts were directed towards education of the subjects for general health, eating practices, and regular exercise. Combining exercises and dietary intervention is the successful regime for weight reduction reported by Frost *et al.*<sup>16</sup> Crosignani *et al.* also reported improvement in anthropometric indices, ovarian physiology and fertility rate induced by diet.<sup>17</sup>

In this study, the mean infertility duration was average 4.60 years and previously taken treatment for infertility was for an average of 5.58 cycles. Spontaneous conception rate was 35 (41.17%) and all these women conceived within first 6 months after reduction of BMI. Clark *et al.*<sup>15</sup> found that the duration of infertility was (5.4 ± 2.5) years and previous fertility treatment was taken for (3.7 ± 1.2) cycles and 18 (32.7%) of the 55 pregnancy conceived spontaneously. The spontaneous conception rate in this study is high, this might be due to major decrease in BMI, and the duration of infertility was more or less same, while previous infertility treatment cycles taken were more in this study.

In this study, out of the 54 women who conceived, pregnancy outcome seen was full term live birth in 32 (59.25%) women, preterm birth in 13 (24.07%) women and miscarriage rate was seen in 9 (16.66%) women. In the Clark's study,<sup>15</sup> 45 (67%) women achieved life birth, miscarriage rate was 18%. In the present study, full term live birth rate was low. There is strong need of awareness in the mass population regarding the effects

of reduction of weight on infertility as well as decrease in weight will enhance the effects of various infertility treatment regimes. This will be done by continuous work on this subject with different research projects. Excessive weight is associated with an increased miscarriage rate. Fairley *et al.* showed that with BMI > 28 kg/m<sup>2</sup> miscarriage rate reported was 15%.<sup>18</sup> Bohrer and Kemmann showed that even a mild increase in BMI (25 – 28 kg/m<sup>2</sup>) leads to a significantly higher risk of pregnancy loss;<sup>19</sup> this is consistent with the present study. Mulders *et al.* also found that obesity is associated with higher cancellation rates and substantially higher miscarriage rates leading to a lower birth rate per started cycles.<sup>20</sup> This decreased success rate is, however, not found by Balen *et al.*, Wang *et al.*, Litsen *et al.* and Maheshwari *et al.* who reported that ongoing pregnancy rate, and live birth rate is, however, consistently decreased especially due to an increased miscarriage rate in obese women.<sup>21-24</sup> This was also seen in the present study as the miscarriage rate was quite high.

### CONCLUSION

Life style modification is the best strategy for weight reduction and contributes to an increase in spontaneous conception rates, conception with ovulation induction therapies and in pregnancy outcomes like decreased rate of miscarriage and increased live births.

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