

A Detailed Survey on Alarming growth of Obesity and Infertility

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Abstract— Obesity is a condition of being overweight. It’s a case where an individual weigh greater than healthy weight. Obesity and overweight have become a common problem of the entire population in the world. The effect of obesity in women’s health is eye-opening and undeniable which in turn is the main cause for women infertility. Obesity influences all the systems of our body including the reproductive system. The fact that obesity in infertile women is very high and there is a strong association between infertility and obesity. This paper shows increased rate of obesity and infertility over a decade. This paper also addresses the various cause for infertility in obese women.

Keywords—BMI, Obesity, Infertility

I. INTRODUCTION

Obesity is a state when excess body fat has been accumulated to the extent where it may have a negative impact on health. The rate of obesity is more in women when compared to men. According to the survey by World Health Organization about 15% of women and 11% of men are obese worldwide. Obesity is defined by BMI (Body Mass Index) and can be evaluated in terms of distribution of fat in the waist-hip ratio. BMI is closely connected to percentage body fat as well as total body fat. Figure 1.1 shows the classification of weight based on BMI according to WHO (World’s Health Organization).

WHO classification of obesity

	BMI
Under weight	<18.5
Normal weight	18.5-24.9
Over weight	25.0-29.9
Obesity class 1	30.0-34.9
Obesity class 2	35.0-39.9
Obesity class 3	40+

Fig 1.1: Classification of obesity

Obesity[9][10] affects the women fertility throughout her life. Infertility is a condition where a woman is not able to conceive. Female infertility can result from age, physical problem, lifestyle, hormone problems or environmental factors. Obesity is also a reason for female infertility. In most of the cases the female fertility is affected by the problem

with the ovulation. Ovulation problems are mainly generated by Polycystic Ovary Syndrome (PCOS). PCOS is problem related to hormone with affects the normal ovulation. PCOS is one of the main cause and also common cause for women infertility. Another cause for ovulation problem is Primary ovarian insufficiency (POI).

Section I contains the introduction of Obesity and women Infertility , Section II shows the growth of obesity over decades, Section III contains about problems of Infertility due to obesity, Section IV shows of growth of Infertility, section V concludes research work with future directions.

II. GROWTH OF OBESITY

According to the recent survey on obesity, India’s women are likely more obese than their male. According to a study published in the British medical journal, the Lancet in India there were 20 million. A survey was done by comparing BMI from the year 1975 to year 2017 in adults in 186 countries showed like China, India and Brazil jumped in rankings when it came to obesity although India and China also have the most underweight citizens in the world. India saw significant rise in the percentage of obesity from 19th position for both men and women in 1975 3rd ranking in 2017, showing increasing obesity rates among women worldwide. The Figure 1.2 shows the graph which shows the rise in women obesity from

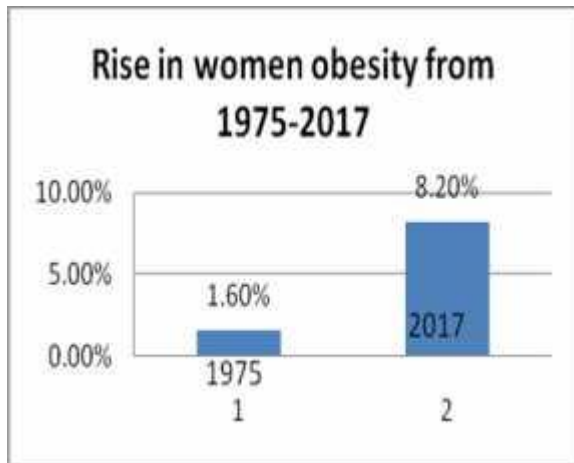


Fig 1.2: Graphs that shows rise in women obesity from 1975 to 2017

According to the survey by NCHS (National Center for Health Statics) November 2015[7]; from 1999-2000 through 2013-2014 there is a significant rise in obesity in both adults and youth. The Figure 1.3 shows the rise in the obesity from year 1999-2000 up to 2013-2014. There is significantly less rise in youth obesity when compared to Adult obesity.

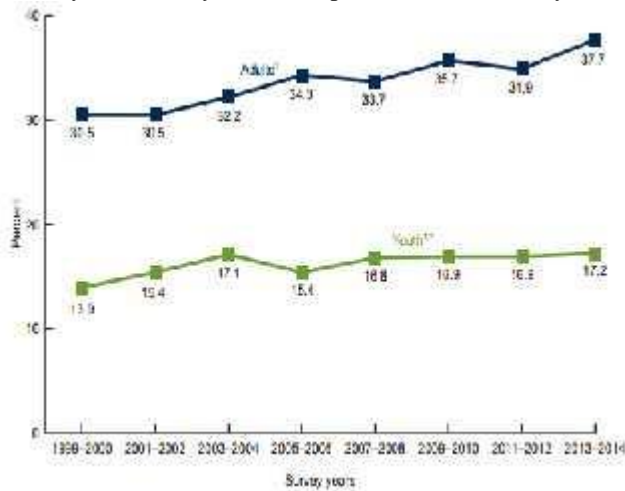


Figure 1.3: Rise in obesity in Youth and Adults from 1999 to 2014

According to survey in DownToEarth [8] article by By Mr. Kundan Pandey Updated on Friday 01 April 2016 on " India's obesity doubled in 10 years" in National Family Health Survey (NFHS-4): Various states across India are facing a rise in the number of people becoming obese. It is observed that 30% of people falling "obese" are from Pondichery. For about 10% population is from MP, Tripura, West Bengal, Bihar, Meghalaya are obese. The ratio has completely doubled since 2005-2006 National Family Health survey (NFHS 3). The table 1.4 shows the obesity has increased from NFHS 3 to NFHS 4 in various states across India. In Karnataka there is rise from 15.3% to 23.3%.

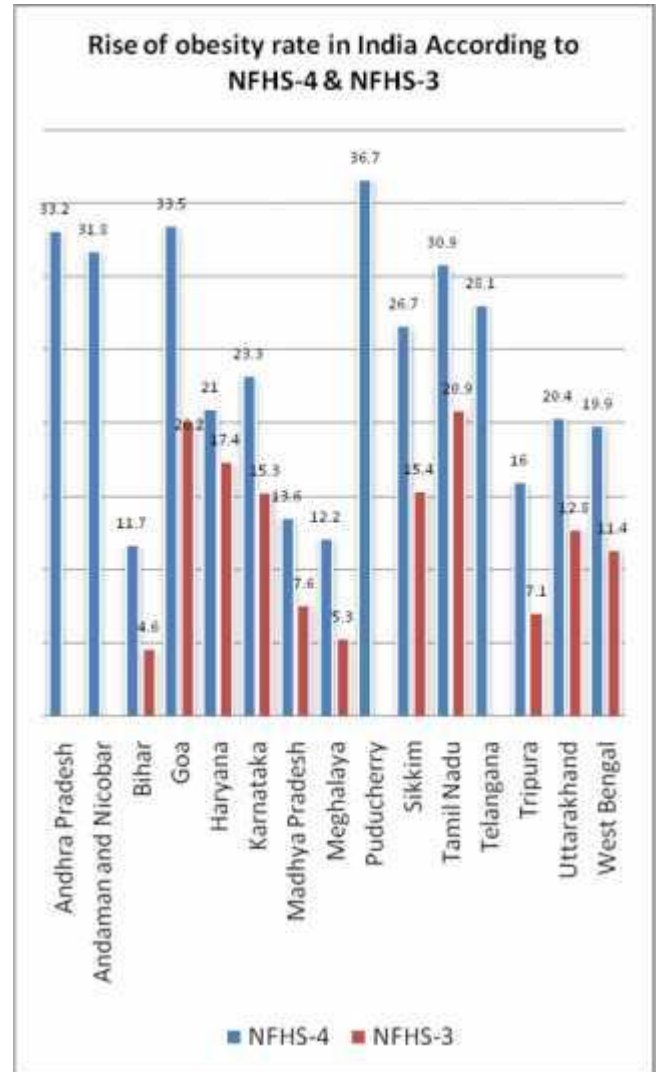


Fig 1.4: Rise of obesity in India according to NFHS-3 and NFHS-4

A survey was done by NFHS 4 on the rise in obesity in Urban and Rural Women population across India. It is observed that about 45.6% of the urban women population are obese whereas 27.6% of the rural women population are obese. In Karnataka alone there is a significant rise in obesity in urban women when compared to rural women i.e from 16.6% to 31.8% . Figure 1.5 shows a graph which compares urban and rural women obesity according to NFHS 4 .

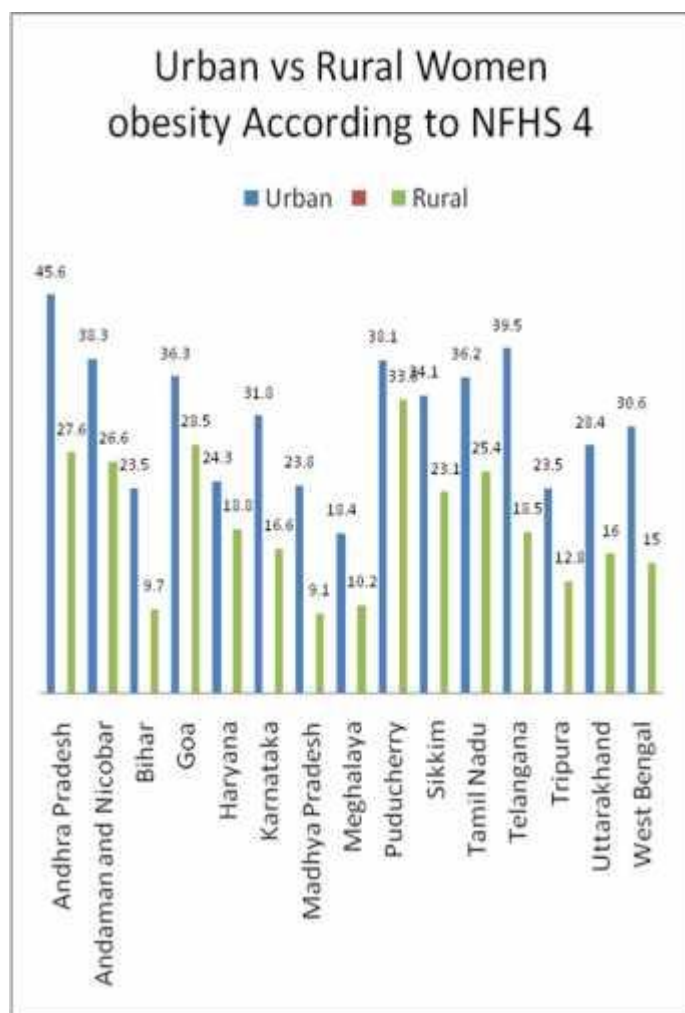


Fig 1.5: Comparison between Urban and Rural women Obesity

III. INFERTILITY DUE TO OBESITY: CAUSES AND PROBLEMS

Obesity could cause hormonal imbalance which will trigger problems with ovulation as well as menstrual cycle. The research in medical science on fertility problems has shown that an obese woman takes longer time to conceive when compared to health weight range women. Research has also shown that there is a very high risk of pregnancy problems like diabetes, miscarriages etc. Following are reasons caused by obesity which may lead to infertility:

(i) Hormones

When body produces excess of fat effects the production of "gonadotropin releasing hormone"(GnRH) which helps in release of follicle-stimulating hormone (FSH) and luteinizing hormone (LH) which plays a critical role in the development of egg.

(ii) Anovulation

Obesity may cause insulin resistance which is reason for anovulation. Anovulation is condition where a woman fails to produce the egg each month from each ovary. Insulin levels will also lead to altered sex hormones. Studies have shown that women having anovulation results in infertility which is 30% higher in women with BMI between 24 and 31 when compared to the normal weight women. Women with BMI value over 31 have the chance of infertility 170% higher.

(iii) PCOS

PCOS is the most common problem that is faced by women of reproductive age. Study has shown that PCOS is related with the excess amount of production of androgens (male sex hormones). Basically every woman produces some amount of androgens and is normal. But when same androgens produced in excess will prevent ovulation which in turn leads to infertility. The excess production of androgens will affect the regular menstrual cycle. PCOS may also cause acne, abnormal hair growth such as facial hair growth or baldness. There are so many reasons which plays a vital role in the secretion of androgens. Excess of insulin will lead to insulin resistance. This decreases the ability of body to use insulin properly. When body cannot use insulin effectively it produces more insulin so that glucose is available to all cells. This resulting insulin will boost the production of androgen by the ovaries.

Many factors may play a role in the production of androgens, and thus the development of PCOS. For instance, excess insulin (the hormone that allows cells to use sugar) may be a factor in developing PCOS. Excess insulin leads to insulin resistance, which in turn decreases your ability to use insulin effectively. When the body cannot use insulin properly, it secretes more insulin to make glucose available to cells. The resulting excess insulin is thought to additionally boost androgen production by the ovaries.

IV. GROWTH OF INFERTILITY

The growth rate of infertility is going higher every year. Due to change in the lifestyle or lack of exercise health issue have increased with respect to infertility. A survey[1] was conducted on 150 women who approached with the problem of infertility. In the survey the population ranged in the age from 21 to 45years (mean 34.8 ± 4.94 SD) and body mass index ranged from 17.9 to 62.9 kg/m² (mean 26.5 ± 7.54 SD). Among the 150 population, 54% of the population was normal, 19.3% were overweight, and 24% were obese.

The Figure 1.6 shows the various health issues caused because of overweight and obesity. In the table shown below approximately 85%-95% of the obese & overweight women population suffers from infertility.

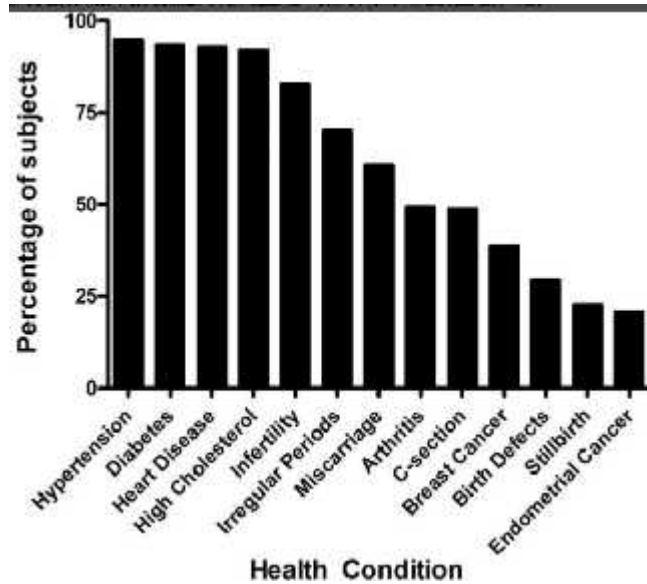


Fig 1.6: Health issues because of obesity & overweight

According to Survey by virtual Medical Center [4] there are various reasons for infertility like age, history of cancer treatment, obesity etc. The proportion of women having child has been reduced from 92% to 26% in the span of 30years.

In the paper National Health Statistical report [5] the fertility rate decreased from 8.5% in the year 1982 (2.4 million women) to 6.0% (1.5 million) in the year 2006–2010. Here the US population is divided onto two category based on the National Survey of Family Growth (NSFG). First one is on Infertility (lack of pregnancy despite unprotected sexual intercourse with same partner for period of 12 months) and second is on Impaired fecundity (physical difficulty in getting pregnant or carrying a pregnancy to live birth). Impaired fecundity increased from 11% in 1982 to 15% in 2002 among married women aged 15–44, but decreased to 12% in 2006–2010. Both impaired fecundity and infertility remain closely associated with age for nulliparous women. The figure 1.7 and 1.8 shows the graph of the survey done here.

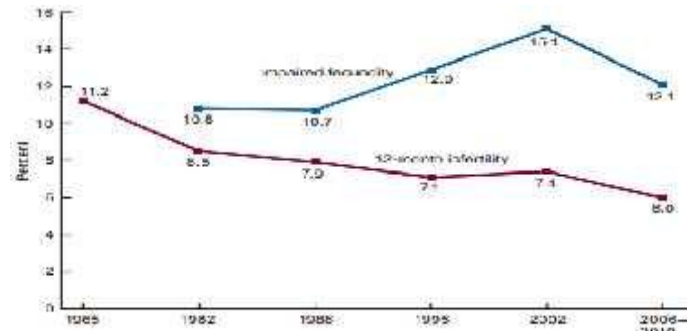


Fig 1.7: Percentages with infertility and impaired fecundity among married women aged 15–44: United States, 1965–2010

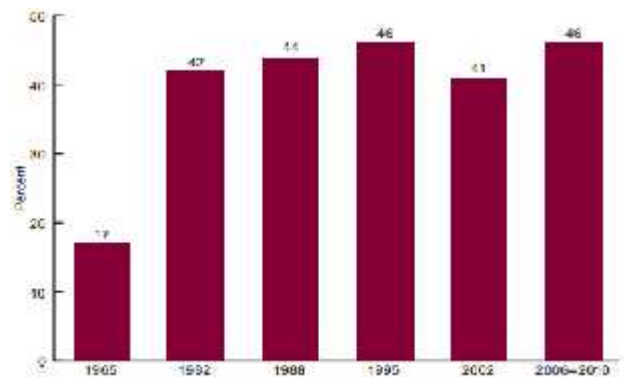


Fig 1.8: Percentage of married infertile women with primary infertility: United States, 1965–2010

V. CONCLUSION AND FUTURE SCOPE

This paper gives a clear picture of rise in the rate in infertility in women caused by Obesity. Infertility may be caused by various reasons but the fact that infertility can be caused by obesity is burning fact. Obesity is one of the common problems in today’s world. Due to lack of time, no proper exercise, change of lifestyle, unhealthy food people are becoming obese and overweight. Obese and overweight population has a greater chance of getting infertile. The figure 1.9 depicts the rise in infertility and obesity over past 20years. From this figure we can conclude that Obesity is a serious issue and which is the main cause for Infertility.

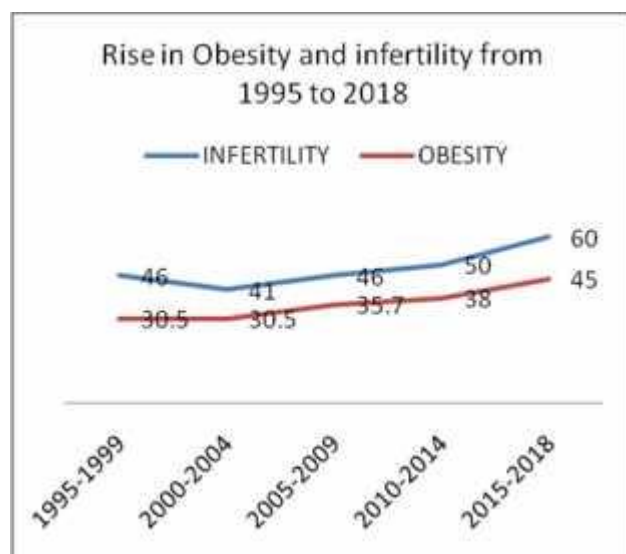


Figure 1.9: Rise in infertility and obesity

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