

OBESITY AND OVULATORY DISORDERS IN INFERTILE JAPANESE

(obesity/infertility/ovulatory disorders)

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Statistical data of obesity in infertile women and the correlation between obesity including emaciation and ovulatory disorder were studied. We found an increased tendency toward obesity in those with ovulatory disorders, as compared to subjects with normal ovulatory cycles. The relationship between obesity and ovulatory cycles or infertility was thus apparent.

Obesity may be related to functional disorders of menstruation and obese women may have irregular, anovulatory or an absent menstrual cycle(1). Rogers and Mitchell(2) noted an increased incidence of obesity in women with amenorrhea, as compared to subjects with a normal menstrual cycle and Hartz et al.(3) found a frequent association of obesity and various disturbances of menstruation, including dysmenorrhea, functional bleeding, amenorrhea and infertility. We report herein statistical data on obesity in infertile women and the correlation between obesity including emaciation and ovulatory disorders is discussed.

METHODS

Three hundred and twelve Japanese aged 21-39 seen in the clinic for treatment of infertility at Shimane Medical University were the subjects studied. Amenorrhea, an irregular menstruation, oligozoospermia etc. were all studied. The obesity index was according to the Japanese variation of Broca's index(4). The patients were grouped into five types according to the index of obesity and of the ovulatory disorders (Table I). Of the 312 women, 217 had regular ovulatory cycles. An inadequate placement of semen seemed to be the cause of infertility in these 217 women. Patients with ovulatory disorders were classified as follows, anovulatory cycle, secondary amenorrhea 1st grade (SA 1st grade), secondary amenorrhea IIInd grade (SA IIInd grade), hyperprolactinemia (hyper PRL), polycystic ovary (PCO).

RESULTS

Of 312 infertile patients, 27 (8.7%) were obese, in that their weights were 20 per cent or over the ideal weight. The incidence of patients whose weight was 10 per cent or over was 21.2 per cent (Table I). Thus one fifth of the infertile patients tended to be obese. Of 95 with ovulatory disorders, including anovulatory cycle, SA 1st grade, SA IIInd grade, hyper PRL, PCO, 25.3 per cent showed a tendency toward obesity (Fig.1).

The 95 were classified by diagnosis and the incidence of obesity in each group was determined. The incidence of normal

Table I. Classification according to the obesity index and disorders related to infertility

diagnosis obesity index	normal ovulatory cycle	an- ovulatory cycle	secondary amenorrhea 1st grade	secondary amenorrhea IIInd grade	hyper prolacti- nemia	polycystic ovary	total
+20% -	16	2	3	0	2	4	27
+10% - +20%	26	4	2	0	3	4	39
-10% - +10%	139	15	8	5	10	12	189
-20% - -10%	34	4	4	3	4	2	51
- -20%	2	1	1	1	0	1	6
total	217	26	18	9	19	23	312

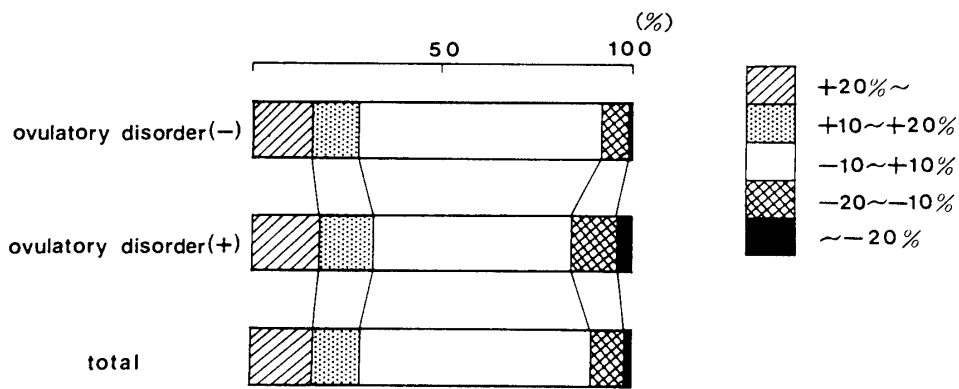


Fig.1. Incidence of obesity index in infertile patients

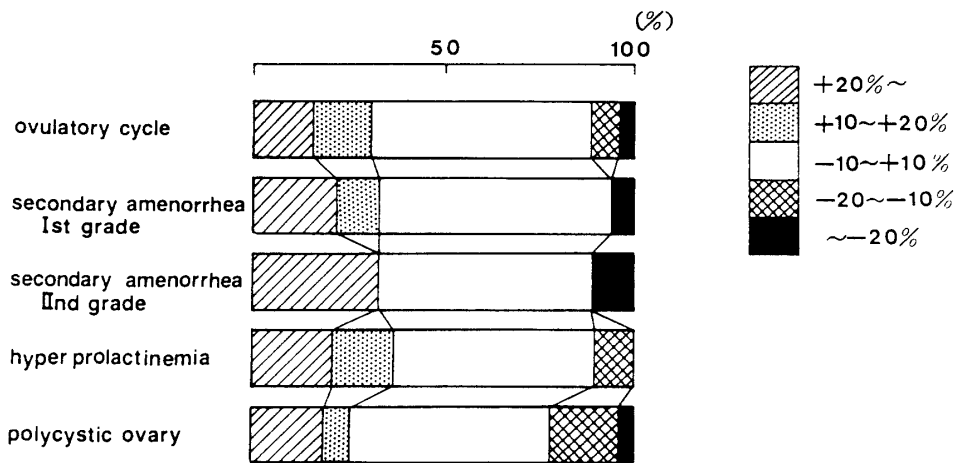


Fig.2. Incidence of obesity index and ovulatory disorders

Table II. Pregnancy rate and each of obesity

obesity index	ovulatory disorder		total
	(+)	(-)	
+20%~	36.4 (4/11)	25.0 (4/16)	29.6 (8/27)
+10%~+20%	30.8 (4/13)	50.0 (13/26)	43.6 (17/39)
-10%~+10%	48.0 (24/50)	30.9 (43/139)	35.4 (67/189)
-20%~-10%	41.2 (7/17)	26.5 (9/34)	31.4 (16/51)
~-20%	50.0 (2/4)	0 (0/2)	33.3 (2/6)
total	43.2 (41/95)	31.8 (69/217)	35.3 (110/312)

Table III. Pregnancy rate, index of obesity and ovulatory disorders

diagnosis obesity index	an ovulatory cycle	secondary amenorrhea I 1st grade	secondary amenorrhea II 2nd grade	hyper prolactinemia	polycystic ovary	total
+20%~	0 (0/2)	33.3 (1/3)	0 (0/0)	50.0 (1/2)	50.0 (2/4)	36.4 (4/11)
+10%~+20%	0 (0/4)	0 (0/2)	0 (0/0)	33.3 (1/3)	75.0 (3/4)	30.8 (4/13)
-10%~+10%	46.7 (7/15)	25.0 (2/8)	60.0 (3/5)	70.0 (7/10)	41.7 (5/12)	48.0 (24/50)
-20%~-10%	50.0 (2/4)	50.0 (2/4)	33.3 (1/3)	25.0 (1/4)	50.0 (1/2)	41.2 (7/17)
~-20%	100 (1/1)	0 (0/1)	0 (0/1)	0 (0/0)	100 (1/1)	50.0 (2/4)
total	38.5 (10/26)	27.8 (5/18)	44.4 (4/9)	52.6 (10/19)	52.2 (12/23)	43.2 (41/95)

range of body weight with an anovulatory cycle accounted for 57.7 per cent, and the lowest incidence was SA Ist grade at 44.4 per cent. In 23 with PCO, the incidence of obesity was 17.4 per cent, but in 9 patients with SA IInd grade, the incidence of emaciation was 11.1 per cent (Fig.2).

Of 312 infertile patients, the pregnancy rate was 35.3 per cent. Only 29.6% of the obese women become pregnant. In those with ovulatory cycles, either the obese or emaciated, the rate of pregnancy was lower, that is 25% or 0%, respectively. In those with ovulatory disorders, there was little difference in each group of obesity index (Table II). With regard to the rate in each group with ovulatory disorders, those with a hyper PRL or PCO showed almost the same pregnancy rate in each obesity index, while the rate in cases of an anovulatory cycle or SA Ist grade showed a decreased incidence of obesity (Table III).

DISCUSSION

Total body weight is an important factor in regulation of the ovulatory cycle(5). Bray and Gallagher(6) found that in cases of demonstrated anatomic hypothalamic disease, both men and women have an associated obesity and hypogonadism. The results of our study indicated that there was an increased tendency toward obesity in those with ovulatory disorders, as compared to subjects with normal cycles.

In those with ovulatory disorders there was a decreased incidence of normal range of obesity index and the obesity rates were increased (Fig.1). Kawakami(4) reported that in those with ovulatory disorders, there was an incidence of 47 per cent of normal range of obesity index and an increased incidence of 13.3 per cent of obesity index. The present study showed a similar incidence in ovulatory disorders (Fig.1). In each group with ovulatory disorders, there was an increased incidence of obesity in the subjects with polycystic ovary as they included those with Stein-Leventhal syndrome, a syndrome with symptoms of obesity(7). Those in the SA IInd grade had an increased incidence of emaciation because of anorexia nervosa(8). In those with normal cycles, the pregnancy rate was lower in the obese subjects. In those with ovulatory disorders, there was little difference at each index of obesity (Table II). Thus the pregnancy rates may differ because each type of ovulatory disorder showed a different

correlation with obesity (Table III).

In conclusion, a correlation between obesity and ovulatory cycles or infertility was apparent. As gonadal function may be diminished in obese women(2), it may be difficult for such individuals to conceive.

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