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Case Study Report on Obesity with Resisted Exercises Versus Resisted Exercises and Diet

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Abstract
This case study subject was initially treated for cervical spine aliments, subsequently was treated for right knee patella femoral arthritis and obesity. Resisted exercises using Physioball and yoga for obesity has resulted more drop in waist circumference than body weight, for the first 2 months. When dietry measures were combined with resisted exercises with Physioball and yoga in next two months more body weight reduction with mild fall in waist circumference were recorded. Hence combining diet and resisted exercises are effective for body weight reduction and RET alone is effective for waist reduction.
Keywords: *BMI: Body Mass Index, RET: Resisted Exercise Training*

Introduction

Obesity is defined as a physiological condition in which excess body fat has accumulated to an extent that can negatively affect health (Bruce Keller et al 2009) while global estimate on obesity with 37% men and 38% women to be obese (Marie etal 2013) with one is every third Indian are obese (Makananka 2014). Prevalence of female obesity in Malaysia at 15% (Rennie etal 2005) and Great Britain at 25% (Ram Pal etal 2007). Prevalence of Musculo skeletal aliments among obese subjects in France 7%, U.K 9%, 21% in U.S and Bangladesh 12.3% (Md Salahuddin etal 2015).

Mrs. XXXX, Aged 49 Years
Waist Circumference 100cm
Body Weight: 75 Kg, Height: 163cms
BMI: 35 kg/ m^2

Background Information

Employed as an executive, complaints of chronic neck pain for 10 years, right knee pain and obesity, was treated elsewhere intermittently with conservative medical and physiotherapeutic means was inconsistent with walking.

H/O

Post Menopausal, Mother of Two adults, Normotensive, non diabetic with no major surgeries undergone, vegetarian.

C/O

Chronic neck pain and right knee and overweight, neck pain with occasional numbness over Trapezius (Right).

O/E

- ✓ Obliterated Cervical Lordosis.
- ✓ Tender Trapezitis (Right).

- ✓ Nil Radicular Symptoms down the upper Extremities.
- ✓ Exagrated Lumbar Lordosis.
- ✓ Bilateral Genu Valgum, Patella (right) Glides) painful.
- ✓ Vastus Medialis Lag Positive on Right Knee.
- ✓ Abdominal Muscle II/IV.
- ✓ Bilateral Hip Muscles Motor Power 3+/5.
- ✓ Ambulant Unaided.
- ✓ Active ROM Knee Right Knee Flexion 0-110, Left Knee 0-120, Restricted Due to Anterior Knee Pain.

Provisional Diagnosis

Patello femoral arthritis (right knee, c4, c5 cervical spondylosis and obesity).

Treatment Given

With few sessions of conservative physiotherapy using manual therapy, proprioceptive techniques and posture corrections, cervical spine related symptoms have decreased along with improved subjects functional daily activities.

The focus of therapy was then shifted to obesity and knee.

The subject was treated with core strengthening and exercises using Physioball for knee as well for obesity for first 8 weeks where waist circumference has decreased from 100cm to 90cm while body weight dropped by 1 kg with no dietry restrictions. The same subject continued the above means of therapy along with dietry advices, the results were of waist circumference dropped by 5cm and body weight by 4kg with second 8 weeks of therapy.

- ✓ Repetition Progressed Gradually
- ✓ Each session for 25-30 minutes, Set of 10 Exercises in Sitting, Supine Lying, Side and Prone Lying

Frequency: Thrice a week each session for 25-30 minutes

Table: Pre and post scores of BMI, waist circumferences with RET and RET and diet:

	Body Weight	RET with 24 sessions frequency of weekly thrice		RET with Diet 25 sessions weekly thrice	
		BMI	Waist Circumference	BMI	Waist Circumference
Pre	Height: 163 cm Weight: 75 kg	35 Kg/ m^2	100 cm	33kg/ m^2	90cm
Post		33kg/ m^2 (Decreased 2 kg ie Decreased by 2.7%)	90cm (Decrease by 10 Cm ie Decreased by 10%)	29 kg/ m^2 (Decreased 4 Kg ie Decreased by 5.3%)	85cm (Decreased 5cm ie Decreased by 5%)

Discussion

1. About half of all British adults have a BMI of >25 while 15% have an index of >30, and these properties are increasing (Gregory etal 1990, Bennett etal 1995).Given the lack of success in the management of obesity and increasing associated health costs greater emphasis on prevention is needed (Scottish office 1992). Approximately two thirds of Americans are classified as obese (Flegal etal 2002) and the vast majority do not engage in regular physical activity (Simpson etal 2003). The relationship between BMI and pain prevalence was stronger for knee pain (Anderson etal 2003) and obesity is likely the most important preventable risk factor for osteoarthritis and is more consistant in women (Fransen and MC Connell 2008). Health care spending of a obese person is 25% more than an average person of that age (Lancet 2010, OECD health data).
2. The major metabolic, cardiovascular risk factors (High Blood Pressure, Plasma Lipids and Insulin Resistance) all

aggregate independently with BMI and waist circumference and improve with weight loss (Dennis and Gold Berg 1993). Persuasive evidence indicates that both obesity and physical inactivity are risk factors for the development of major chronic diseases and premature death (Katzmarzyk et al 2003). Linear relationship of obesity and mortality were recorded (Frank etal 2004). Weight loss due to a fat reduced diet, lifestyle modifications and exercises results in a sustained reduction in cardio vascular risk factors (Woods 1991) and also the effect of weight loss was suggested to reduce the risk for osteoarthritis by half. Drop in BMI 1.8 kg/m^2 among obese subjects with RET and diet (Subramanian etal 2014) Stella vol pe etal 2008 have recorded with diet and exercises drop by 1 kg /m^2 in normal subjects. Old rogd etal 2001 have recorded with diet and exercises 1 kg/m^2 drop in BMI, exercise in combination with dietry changes promotes loss of adipose tissue with preservation of lean body mass (Hill et al 1987). 1 kg / m^2 drop in BMI among normal subjects with RET and diet (Baik et al 2000). Weight loss of 1Kg/ m^2 BMI reduces female symptomatic knee by 33% (Felson 1996). With RET and diet in this subject with 2 months of therapy a drop in BMI by 4Kg/ m^2 and reduction of waist circumference by 5cm (5%) findings are supported with the above mentioned researches.

3. Waist circumference is the best indicator of changes in intra abdominal fat during weight loss (Vander etal 1993).Chan etal 1994 who found progressively increasing relative risk of developing NIDDM in men as waist circumference rose. Pouliot etal 1994 observed exponential increase in cardio vascular risk factors with waist circumference above 87 in men, 78cm in women. Waist circumference is a stronger predictor than BMI (Zhan swang 2002). Ronald Sigal 2007 among diabetic subject a drop in 4cm waist circumference with RET and 13 cm reduction in waist circumference reported in one year duration using RET among normal obese subject (Subramanian 2016). Exercises combined with weight loss appear to be more effective than either intervention alone (Messier etal 2004). Holiday etal 2011 have recorded waist circumference was associated with osteoarthritis knee risk. Christensen etal 2007 have reported weight loss of greater than 5% per week over a 20 week period can lead to a significant improvements in disability. RET among Sedantry subjects drop by 1 kg /m^2 (Martin 2010). With resisted exercises training alone reduction of BMI by (2.%) 2 kg/ m^2 and drop in waist circumference by 10cm (10%) in this case study subject in 2 months duration is similar to findings in the above studies.
4. Possible mechanism of reduction with RET on BMI could be due to fiber shift in exercising muscle with a hyper trophic response (Carmen 2002) and an increase in GLUT4 protein (Selvin 2004) and a decreases in visceral adiposity (Salma etal 2002). As strength training impact to minimize loss of lean muscle mass that would otherwise exacerbate muscle weakness (Toda 2001).

Conclusion

As obesity is associated with Musculo skeletal ailments, weight reduction measures are more effective when coupled with any specific physiotherapeutic measure; than treating alone with physiotherapy intervention. Along with when dietry advices are adhered with enhanced benefits are obtained as a key finding of this case study report. Body conditioning and improve tone can be achieved with exercises alone but dietry restrictions combined with exercises are effective

in weight reduction and improved physique is the major outcome of this case report.

Further study including larger sample size, longer study duration are required to validate findings of this original case study findings are recommended.

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