PRESCRIPTION OF EXERCISE IN THE PERIMENOPAUSE AND MENOPAUSE

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AIM: Aim of this article is to sensitize the obstetricians about the positive role of exercise in perimenopause and menopause and especially role of weight bearing and resistance exercises so that they can guide the patients about the various advantages of exercise.

INTRODUCTION

Average age of menopause is 52 years and so woman have about half of their adult life or 1/3 rd of their life after menopause, so the health of women in this period is of utmost importance for the woman and the society as a whole

Menopause and the surrounding years are the golden years of a women's life and this phase is supposed to be a physiological transitional era only but can sometimes turn into nightmare for some of women if the normal physiological symptoms turn into pathological states.

By timely intervention and some life style modification like exercise and diet starting in the perimenopause itself the old age can be a comfortable, independent, enjoyable and healthy era of a woman's life and the old age disabilities can be delayed and prevented. As body changes start at about mid thirties so we can say that 35 years onwards we should start life style modifications if we are already not practicing them.

We are talking about role of exercise but no proper guidance is given about what type of exercise and for how long.

This article would just cover basic evidence about exercise and other information and how to go about these exercises is under heading of HEALTH AND FITNESS.

Changes in Menopause

Weight gain

Hot flushes

Mood changes

Sleep disturbances

Dryness of vagina

Dysuria

Depression

Risk of osteoporosis

Increased risk of CHD

hypertension

Alzheimer

Dysuria and dryness of vagina are estrogen dependent and don't respond to exercise and on all others exercise does have an effect.

Weight gain and strength loss

Average weight of a woman should be 100 lbs plus 5 lbs for every inch above 5 ft height or BMI of 20-25(Wt. in kgs divided by height in sq meter) or roughly Ht in cms -100 is wt. in Kgs. Waist hip ratio should be less than 0.8.

It is seen that obesity in adult age rises in women in each decade until it starts tapering off in the seventies.

The postmenopausal women lost more fat-free body mass (3 kg [6 lb] vs. 0.5 kg [1 lb]) and had greater increases in fat mass (2.5 kg [5.5 lb] vs. 1 kg [2.2 lb]) than the premenopausal women. Lean muscle mass decreases 30% to 40% relative to total body mass as we age. This process

begins at around 30 years of age and progresses exponentially with time. Muscle strength also decreases over the same period. Initial strength loss is usually subtle, but can often be recognized by the patient at around 50 years of age.

Consistent pattern of increased central adiposity during menopause is seen and that is very important, WHR (Waist hip ratio is increasing and strength is decreasing

What is causing these changes in menopause is age related decline in BMR,reduced physical activity and loss of ovarian function and luteal phase which results in decreased BMR.But what is most important is loss of fat free mass or muscle mass or sarcopenia which is occurring along with increased fat mass. These results in reduced strength and causes of sarcopenia may be neuroimmunoendocrine factors that may regulate the maintenance of muscle mass or its loss with age.

Estrogen potentiates growth hormone secretion; the loss of this potentiating could be a factor in the loss of an important tropic effect on skeletal muscle

Women make more interleukin-1 than men, especially during the luteal phase of their menstrual cycle the production of interleukin-1 during the luteal phase parallels increases in resting energy expenditure, resulting in an increase in the energy intake necessary to maintain body composition. Interleukin-1 is not secreted in the luteal phase after menopause; however, because intake may not be accurately adjusted, the observed increase in fat could result (8)

What ever the mechanism involved this loss of fat free mass results in functional losses in muscles resulting in trouble in performing routine activities of life. This leads to loss of strength, stamina and stability.

Declines in muscle mass and strength are comparable to the loss of bone mass from young adulthood to old age. So an approach of prevention of these effects of aging which are accelerated by menopause is a must!

How to control weight gain and strength loss?

Caloric restriction, the centerpiece of weight-loss efforts for most women, depresses metabolism still further, often leading to frustration and failure. It is clear that by calorie restriction not only results in decreased in RMR so resting energy expenditure is reduced but along with fat ,muscle mass in also decreased and so stamina is further decreased and on rebound more weight gain

is there.

Exercise is particularly helpful for middle-aged women who want to control their weight because it reverses the diet-induced reduction in metabolic rate and also increases fat-free mass. In fact, physical activity of sufficient magnitude can largely offset age-related changes in body composition. A cross-sectional study of female athletes and sedentary women, aged 18 to 69, found no difference in body fat percentage and fat-free mass between the youngest and oldest athletes. In addition, the resting metabolic rate of the older exercisers was closer to that of the young athletes than to that of sedentary, age-matched women.

Resistance training especially targets the decrements in muscle mass and function typically seen in sedentary persons. Evidence now indicates that one is never too old to benefit from exercise; this is true even for frail institutionalized women as old as 100 years So the prevention of weight gain and its control has to be through calorie restriction along with aerobic and weight training and resistance exercises.

Age is no bar. Menopausal status does not appear to lower a woman's ability to favorably alter her body composition and cardio respiratory endurance.

High-intensity strength training results in significant and progressive increases in strength in older women. Large gains in muscle strength are possible if a relatively high intensity of training stimulus (80% of previously established 1RM) is maintained, and if the training load is progressively increased based on frequent 1-RM measurements. a resistive training increases fat-free mass and maintains RMR despite weight loss in postmenopausal women and so(resistive training) is a valuable component of an integrated weight management programme in postmenopausal women.Fiatarone and others even noted progressive strength gains in frail 86- to 96-year-old men and women participating in a strength-training program. Women’s healthy life style project (WHLP) in which randomized control trial for 5 yrs in 535 healthy women of 44- 50 yrs age group of premenopausal and menopausal women was done with life style modification of dietary restrictions with exercise in that study they again concluded

Prevented weight gain rather lost weight

Decreased waist measurement

Decreased LDL-C factor

Decreased triglycerides

Decreased glucose levels

The public health benefits of more widespread exercise, measured in terms of improved strength, mobility, and balance and delay of frailty and institutionalization, could be great and cost-efficient indeed.

Menopause and bone mass

Peak bone mass is attained by the age of 35

From age 35 onwards, women lose bone mass at a rate of about 0.75% to 1% per year, and the loss increases to 2% to 3% per year at menopause, most markedly from the lumbar spine.

Osteoporosis may be asymptomatic till fractures occur. Previous H/Fractures, loss of height more than 1.5 inches, backache, and chronic fatigue should arouse the suspicion of osteoporosis and diagnosis is by DXA scans.

CORELATION BETWEEN MUSCLE STRENGTH AND BONE DENSITY

The literature does show correlations between muscle strength and regional bone density

A significant positive correlation was found between BMD and back extensor strength in healthy postmenopausal women, even when BMD was corrected for age

In young population Swimmers have more BMD in radius than non swimmers

Tennis players have more BMD in the dominant arm.

Exercise and BMD in Menopause

A study of 25 women, 49 to 61 years old, found that those who jogged or played volleyball had

significantly greater lumbar spine BMD than those who had no regular physical activity.

In another study increase in lumbar spine bone mineral density (BMD) of 3.5% in women was seen who exercised, whereas BMD in the controls decreased 2.7%, suggesting that exercise can inhibit or reverse the osteoporosis associated with aging.

COCHRANE REVIEW

Aerobics, weight bearing and resistance exercises are all effective in increasing the BMD of the spine in postmenopausalwomen. Walking is also effective on the hip.

Exercise (aerobic, aerobics and weight bearing, resistance, and walking) v control in postmenopausal women at 1–2 years*

Comparisons Site measured NRCTs (number of participants) Weighted mean difference (95 % CI)

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AWB exercise v control Spine 8 (336) 1.79 (0.58 to 3.01)!

Hip 5 (287) 0.68 (-1.18 to 2.53)

Wrist 3 (160) 0.09 (-1.15 to 1.33)

Aerobic exercise v control Spine7 (375) 0.83 (0.08 to 1.58)!

Hip 5 (335) -0.07 (-1.18 to 1.03)

Wrist 2 (186) 1.22 (0.71 to 1.74)

Resistance exercise v control Spine 2 (57) 2.50 (0.44 to 4.57)!

Hip 3 (108) 0.41 (-0.85 to 1.67)

Wrist 1 (42) -0.28 (-3.21 to 2.65)

Walking exercise v control Spine 3 (156) 1.31 (-0.03 to 2.65)!

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*AWB = aerobics and weight bearing; NRCTs = number of randomized controlled trials. CI defined in glossary.

! Difference favors exercise.

Meta-analyses did using a random effects model.

BEST (Bone, Estrogen, Strength Training) study done for 4 years and reported in Dec2005 (20)

It previously was thought that any type of exercise was helpful, but now we understand that resistance and weight-bearing exercise are essential."

In this study exercise consisted of 3 days a week of 60 to 75 minutes per session in a community facility with a trainer and was composed of leg press, military press, seated row, squats, back extension, and lateral pull down. Participants did 2 sets of 6 to 8 repetitions with 7 to 10 minutes of cardiovascular weight-bearing activity for each session. Total calcium intake was 1700mg about 900mg in diet and 800mg /day as supplementation as calcium citrate.

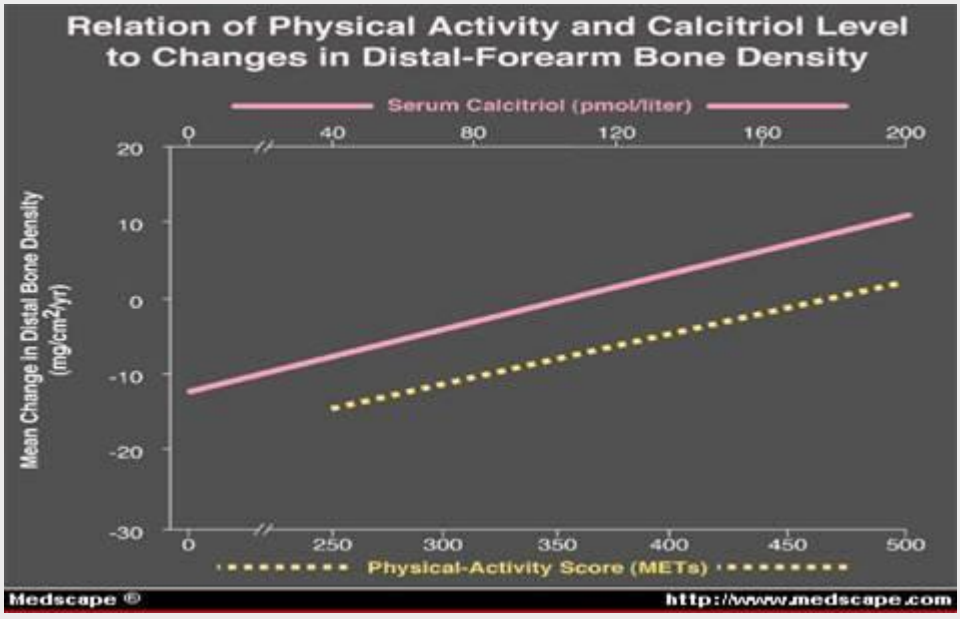
Adjusted multiple linear regression models revealed that Extra was positively and significantly related to changes in femur trochanter (FT) and neck (FN), lumbar spine (LS), and total body (TB) BMD. For women receiving HT, FT BMD increased 1.5%, and the FN and LS BMD

increased 1.2% (P < .01) for each SD of percentage ExFreq (29.5% or 0.9 days per week). Women not using HT gained 1.9% and 2.3% BMD at FT and FN, respectively, for every SD of CI (P < .05)

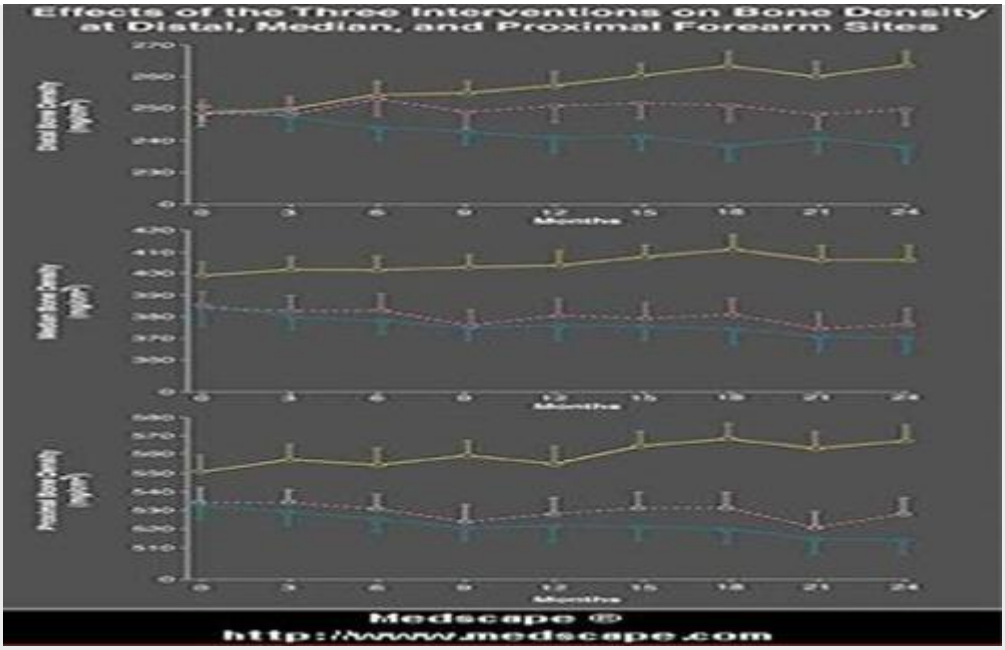
We know bones are 99.5% calcium so of course proper calcium intake is a must for the bone building process.

In the 2 year study done by Prince et al (21) proved that exercise with calcium has a better gain in BMD and exercise with estrogen replacement therapy had greater increase in BMD in distal-median-and proximal forearm sites.

Short-dashed line shows positive correlation between baseline level of physical activity and mean change in distal-forearm density in an exercise-only group during a 2-year study period. Physical activity was measured in metabolic equivalents (METs) (y=0.07x-32; r=0.37; P=0.02). One MET is defined as energy consumed per minute of sitting at rest. Long solid line shows positive correlation between baseline serum calcitriol concentration and mean change in distal-forearm bone density in an exercise-calcium group over same study period (y=0.11x-12.19; r=0.54; P=0.001). Data from Prince et al.(21)



Comparison of bone-density effects of exercise alone (dotted line), exercise along with supplemental calcium (dashed line), or exercise with estrogen therapy (solid line). Measurements are means ± SE of bone density of distal-, median-, and proximal-forearm sites during a 2-year study period. Data from Prince et al.(21)



So there is enough evidence in the literature to recommend walking, weight bearing aerobic, resistance exercises and weight training to build bone mass, stamina, strength and stability in old age and age in no bar.

How Exercise Builds Bone?

Although the evidence that exercise prevents and combats osteoporosis is substantial, how it does so is far from clear. Both mechanical and hormonal processes appear to be involved. One explanation of the way bone responds to exercise is the "error strain distribution hypothesis."

According to this theory, bone cells sense the mechanical strain induced by weight-bearing or resistance exercise. The cells then communicate load imbalances with each other on a local level. In vitro, mechanical strain causes a cellular influx of calcium ions, followed by production of prostaglandin and nitric oxide, increased enzyme activity, and the release of growth hormones; these changes may trigger bone remodeling. The theory suggests that such changes also occur in vivo.

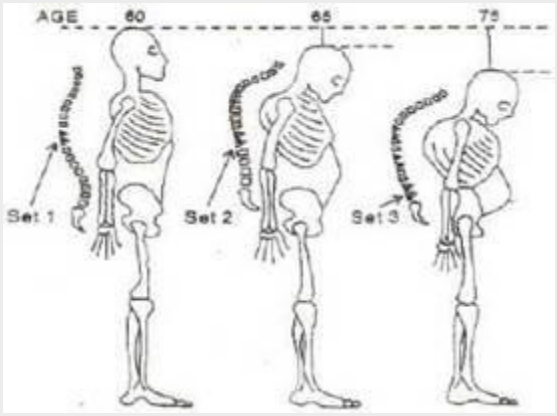
Spinal complications of osteoporosis

kyphosis

vertebral wedging

Compression fractures.

The most common fractures due to osteoporosis are vertebral fractures, and yet less than a third of all vertebral fractures are clinically diagnosed.



Back exercises for kyphosis

The thoracic kyphosis of estrogen-deficient women has been found to be directly correlated with weakness of the back extensor muscles, and increasing the back extensor strength has been shown to decrease the kyphosis. This was prospective 10yrs trial. In this instance, when the torso is carried flexed forward, the patient will need to retrain the extensor muscles of the spine with isotonic resistance exercises. This is most effective when done in an upright, weight bearing position.

Hot Flushes at Menopause

Up to 75% of women in the climacteric menopause years experience hot flushes, and up to 10% are still experiencing them 15 years later

ORIGIN OF HOT FLASHES

Hypo estrogenic state

lower levels of beta-endorphins

decreased central upload activity

Alterations in Gonadotropin-releasing hormone and luteinizing hormone levels may also play a role

HOT FLUSHES AND AEROBICS

Premenopausal women (mean age, 43.1 ± 2.8 years) and postmenopausal women (mean age, 53.7 ± 3.7 years) showed increased levels of estrogen after participating in an aerobic training program, and 55% of the postmenopausal women experienced a decrease in the severity of hot flushes.

Prince and co-workers in a 2-year study of 120 women and 42 controls, fewer postmenopausal women (mean age, 56 years) in the exercise-plus-ERT (n=40) group had hot flashes than in the exercise-only and the exercise-plus-calcium groups (n=41 and n=39, respectively).however incidence of hot flushes decreased in all the three groups. Sleep disturbances and dyspareunia were decreased only in ERT&Exercise group.

Modifying Cardiovascular Disease Risks

Direct effect Exercise has direct effects on the cardiovascular system by increasing oxygen delivery and utilization, and by decreasing the risk of ventricular arrhythmogenicity of the heart and the overall risk of sudden cardiac death

The indirect effects of exercise are by modifying CHD risk factors, like decrease in the levels of LDL,total cholesterol and triglycerides.But exercise does not affect the levels of HDL

Exercise and mood elevation

Women may decrease stress and depression with exercise but, inversely, the depressed woman is less likely to initiate or maintain a regular exercise program. The most frequent reason given for not exercising is lack of motivation, which may result from or be preceded by stress or depression. It is important to consider each woman's situation individually and to promote the overall benefits of exercise

Longevity and Exercise:

Even a minimal amount of physical activity resulted in a reduced mortality risk. More frequent and intense levels of activity resulted in greater reductions in risk; among the self-reportedly

most active respondents, the overall mortality risk decreased by 30% compared with the least-active (or non-active) participants. Those women who exercised once a week benefitted from a 12% reduced mortality risk compared to sedentary women in the study. Reductions in mortality rates were most dramatic in the areas of cardiovascular and respiratory diseases. Those women who were the most active were the least likely to die from cardiovascular and respiratory illnesses. (Data from 40,417 postmenopausal women in Iowa (age 55-69), over a seven-year period (1986 to 1993).

To summarize

A reasonably balanced approach to regular exercise can generate similar benefits as HRT and usually without unnecessary risks. Benefits of exercise are seen in the following areas:

Increases in bone mineral content and/or decreased bone turnover

Decreased weight

Favorable alterations in the blood lipid profile (decreased LDL/HDL-cholesterol ratio)

Decreases blood pressure and exercise-induced ischemia

Antioxidant properties

Decreased depression and anxiety scores

Reduction in hot flashes

Increases in central endorphin activity

Arterial vasodilatation

Decreased symptoms of depression

Improved muscle strength and endurance

Better stamina and feeling of well being

Improved personal image

VERY IMPORTANT!!!!!!!!
PERSCRIPTION OF EXERCISE

There must be recognition in society that physical activity is a vital component of a healthy lifestyle and essential for disease prevention

A prescription for exercise should be given to virtually every woman at menopause—not to address specific symptoms of hormonal changes, but to initiate or reinforce patterns for general health maintenance. These patterns are important because women who are about 50 years old and inactive will lose muscle strength, bone density, and functional capacity at an accelerated pace as the effects of disuse are added to those of aging. The longer exercise is delayed, the more difficult it will be to begin

In order to achieve a near full range of health benefits from physical activity women will need to participate in a consortium of physical activity beyond just weekly aerobics classes. The following are characteristics of a balanced exercise program which may optimize health benefits:

Regular aerobic exercise of varying intensity 3x/ week

Resistance exercise (e.g. weight training, weight bearing exercise, 2or3x/week

Utilitarian exercise (household chores, yard work, gardening, etc.) 4-7x/week

Mindful exercise (quiet reflective time combined with moderate exercise, e.g. hatha yoga, meditation walking, etc.) 2x/week

So we should give proper prescription of exercise to all the perimenopausal and menopausal women and more work needs to be done in this area.