

Physiotherapy in Pregnancy

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Abstract

Pregnancy is commonly associated with faulty posture, pedal edema, pelvic floor stresses, changing body image and various musculoskeletal pathologies. Exercise has a beneficial role in improving the general well being. However, adjustments has to be made to the normal exercise routine according to the changing demands of the mother's body. Exercise plan greatly depends upon various conditions associated with pregnancy, relative and absolute contraindications. Therefore, the level of the exercises is to be strictly recommended by a Physiotherapist in consultation with Obstetrician. Thereby, the purpose of this article is to discuss the goals, guidelines, types, intensity and frequency of the exercises during pregnancy and post partum period.

Keywords: *Pregnancy; Physiotherapy; Exercise; Indications; Absolute and Relative Contraindications; Goals; Guidelines; High Risk Pregnancy; Post partum period; Cesarean.*

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able to cope with the physical and emotional changes during the subsequent nine months.

Benificial Changes in Physiological Parameters of Mother

Stroke volume and cardiac output both increases with steady exercise. This coupled with increased blood volume and reduction in systemic vascular resistance during pregnancy may help to offset the effect of vascular shunting.

Respiratory Rate

The pregnant woman reaches a maximum exercise capacity at lower work level than a non pregnant woman due to increased oxygen requirements of exercise. Thus, maternal respiration rate appears to adapt better with mild exercise as compared to moderate or severe exercise.

Hematocrit level

Maternal hematocrit level during pregnancy is lowered, however, it rise up to 10 % points within a 15 minutes of exercise.

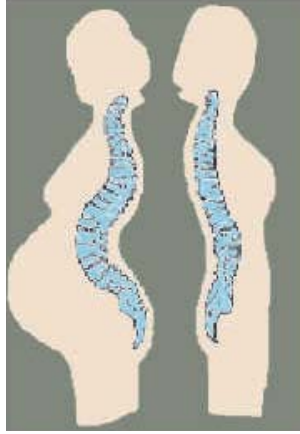
Uterine contractions

Norepinephrine and epinephrine levels increase with exercise. Norepinephrine increase the frequency & strength of uterine contractions.

Core body temperature increases.

Introduction

Physiotherapy can be started as early as pre conception. Because every organ system within the mother's body will alter & adjust according to the demands made upon it by the growing foetus (Andrew 2008 Angeta 2012), the women who begins pregnancy feeling fit and comfortable is more likely to be



Fetal response to Exercise

1. Brief submaximal maternal exercise (up to 70 percent maternal aerobic power) does not adversely affect fetal heart rate. The fetal heart rate (FHR) will usually increase 10 to 30 beats per minute at the onset of maternal exercise. Following mild to moderate maternal exercise, the FHR usually returned to normal level within 15 minutes.
2. The fetus has no mechanism such as evaporation or respiration by which to dissipate heat. But because physically fit women are able to dissipate heat and regulate their core temperature, this is no longer considered a reason to restrict exercise.
3. Slight decrease in birth weight in the newborn of women who continue endurance exercises into the third trimester of pregnancy is reported on the average of 310 g. There is no change in head circumference or heel-crown length. The decreased weight is proposed to be the result of slightly earlier delivery and less body fat.

Potential Impairments/Problems of Pregnancy Summarized

1. Development of faulty postures.
2. Upper extremity stresses caused by the physical changes of pregnancy and the muscular requirements of infant care.
3. Changing body image.

4. Altered circulation, varicose veins, lower extremity edema.
5. Pelvic floor stress or trauma.
6. Abdominal muscle stretch and trauma and diastasis recti.
7. Inadequate relaxation skills, necessary for labor and delivery.
8. Improper body mechanics.
9. Development of musculoskeletal pathologies associated with pregnancy.

Exercise during Pregnancy and Postpartum

General Goals for the Exercise Program

1. Promote improved posture before and after pregnancy.
2. Increase awareness of correct body mechanics.
3. Prepare the upper extremities for the demands of infant care.
4. Promote increased body awareness and a positive body image.
5. Prepare the lower extremities for the demands of increased weight bearing and circulatory compromise.
6. Improve awareness and control of the pelvic floor musculature.
7. Maintain abdominal function and prevent or correct diastasis recti pathology.
8. Promote or maintain safe cardiovascular fitness.
9. Improve relaxation skills.
10. Prevent problems associated with pregnancy (i.e low back pain, pelvic floor weakness, decreased circulation)
11. Provide education on safe postpartum exercise progression.

Guidelines for Exercise Instruction

1. Suggest each participant have a physical examination by a physician prior to engaging in an exercise program.
2. Each person should be individually evaluated prior to participation to screen

for pre-existing musculoskeletal problems, posture and fitness level. Exercise levels should not exceed prepregnancy levels.

3. Stretching exercises should be specific to a single muscle or muscle group and should not involve several groups at once. Asymmetric stretching or stretching multiple muscle groups can promote joint instability. Ballistic movements should be avoided.
4. No joint should be taken beyond its normal physiologic range.
5. Hamstring and adductor stretches should be used with caution. Overstretching of these muscle groups can increase pelvic instability or hyper mobility.
6. It is suggested that supine positioning not exceed 5 minutes at any one time after the fourth month of pregnancy to avoid vena cava compression by the uterus. When supine, a small wedge or rolled towel placed under the right hip will lessen the effects of uterine compression on abdominal vessels and improve cardiac output by turning the patient slightly toward the left.
7. To avoid the effects of postural hypotension, rising from the floor to standing should be undertaken slowly.
8. Discourage breath holding and avoid activities that increase the tendency toward the Valsalva maneuver, because this may lead to undesirable downward forces on the uterus and pelvic floor.
9. Break frequently for fluid replenishment. The risk of dehydration during exercise is increased in pregnancy.
10. Encourage complete bladder emptying prior to exercise. A full bladder will place increased stress on an already weakened pelvic floor.
11. Include appropriate warm-up and cool down activities.
12. Discontinue any exercise that causes pain.
13. When prone, avoid the knee-chest position with buttocks elevated above the chest level, especially in the postpartum client,

because of the risk of air embolism. A pregnant woman is at risk only if bleeding or other symptoms of early placental detachment are present. An air embolism can occur when the buttocks are elevated and uterus moves superiorly. The pressure change causes air to be sucked into the vagina and uterus, where it can enter the circulatory system through the open placental wound.

14. Observe participants closely for signs of overexertion or complications. The following signs are reasons to discontinue exercise and contact a physician:
 - a. Pain
 - b. Bleeding
 - c. Shortness of breath.
 - d. Irregular heart beat.
 - e. Dizziness
 - f. Faintness
 - g. Tachycardia
 - h. Back or pubic pain
 - i. Difficulty in walking

Recommendations on Fitness Exercise (Frequency and Timing)

Note: These recommendations are for pregnant women with no maternal or fetal risk factors and are adapted from the American College of Obstetricians and Gynecologists.

1. It is preferable to exercise regularly at least 3 times per week rather than intermittently.
2. If the woman cannot safely maintain balance because of the shifting and increasing weight, she should refrain from exercises that could result in falling and injury to herself or the fetus. She should also refrain from any activity that could result in abdominal trauma.
3. Adequate caloric intake for nutrition and adequate fluid intake and appropriate clothing for heat dissipation are critical.
4. Exercises can be started 16 weeks onwards.

5. Resumption of prepregnancy exercises during the postpartum period should be gradually resumed and continue for 4 to 6 weeks postpartum.

Contradictions to exercise

1. Absolute Contradictions

- a. Incompetent cervix, early dilatation of the cervix before the pregnancy is full term.
- b. Vaginal bleeding of any amount.
- c. Placenta previa: placenta is located on the uterus in a position where it may detach before the baby is delivered.
- d. Rupture of membranes: loss of amniotic fluid prior to the onset of labor.
- e. Premature labor: labor beginning prior to the 37th week of pregnancy.
- f. Maternal heart disease.
- g. Intrauterine growth retardation.

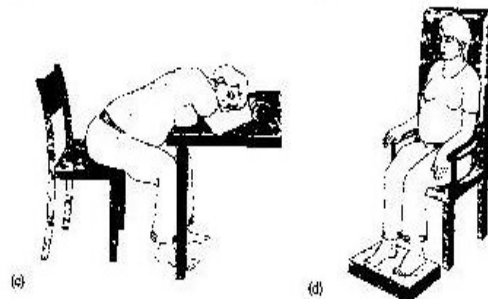
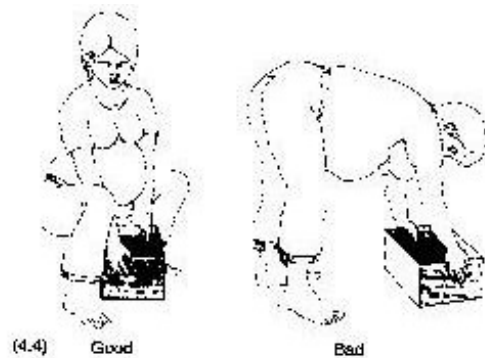
2. Relative Contraindications

The woman with one or more of the following conditions may participate in an exercise program under close observation by a physician and a therapist as long as no complications arise. Exercises may require modification.

- a. Multiple gestation (These infants are frequently born prematurely. Because some exercises may precipitate uterine contractions, these patients must be watched closely.)
- b. Anemia: reduction in the number of red blood cells, the amount of hemoglobin, or both (causes a reduction in the oxygen-carrying capacity of the blood)
- c. Systemic infection.
- d. Extreme fatigue.
- e. Musculoskeletal complaints and/or pain.
- f. Phlebitis
- g. Diastasis recti

Suggested Sequence for Exercise Class

1. General rhythmic activities to 'warm up'.
2. Gentle selective stretching.
3. Aerobic activity for cardiovascular conditioning (15 minutes or less)
4. Upper and lower extremity strengthening.
5. Cool down activities.
6. Abdominal exercises.
7. Pelvic floor exercises



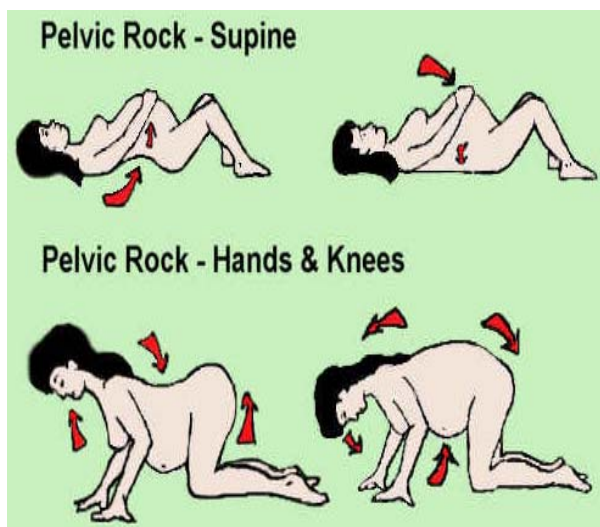
8. Relaxation techniques.
9. Educational Information (as appropriate)
10. Postpartum exercise instruction (e.g. when to begin exercises, how to safely progress, precautions).

Critical Exercises of Emphasis and Selected Exercise Techniques

1. Posture Exercises

a. *Stretching (with caution)*

- Upper neck extensors and scalenes.
- Scapular protractors, shoulder internal rotators, and levator scapulae.
- Low back extensors.
- Hip adductors. (caution: do not overstretch in women with pelvic instabilities.)
- Knee flexors (caution: Do not overstretch in women with pelvic instabilities.)



- Ankle plantar flexors.



b. *Strengthening*

- Upper neck flexors, lower neck and upper thoracic extensors
 - Scapular retractors and depressors
 - Shoulder external rotators
 - Knee extensor
 - Ankle dorsiflexors
2. Abdominal muscle exercise
 - a. Quadruped pelvic tilt exercise
 3. Leg sliding

4. Pelvic Floor awareness training and strengthening
5. Modified squatting
6. Scapular retraction
7. Perineum and adductor flexibility
 - These flexibility exercises prepare the legs and pelvis for childbirth.
8. Relaxation and breathing exercises
9. Mental Imagery

Exercises that are not safe during Pregnancy

1. Bilateral straight -leg raising
2. "Fire hydrant" exercise.
3. All -fours hip extension
4. Unilateral weight-bearing activities.

Exercise Critical to the postpartum period

Exercise can be started as soon after delivery as the woman feels able to exercise. All prenatal exercises can be performed safely in the postpartum period for 4 weeks in case of normal delivery.

Cesarean Child birth

Impairments/Problems summarized:

1. Risk of Pneumonia.
2. Postsurgical pain and discomfort.
3. Risk of vascular complications.
4. Development of adhesions at incisional site
5. Faulty posture.
6. Pelvic floor dysfunction.
7. Abdominal weakness.

Exercises

- a. The woman should be instructed all prenatal exercises as described above.
- b. The woman should be instructed to begin preventive exercises as soon as possible during the recovery period.
 - (i) Initiate ankle pumping, active lower extremity range of motion, and walking

- to promote circulation and prevent venous stasis.
- (ii) Initiate pelvic floor exercises to regain tone and control of the muscles of the perineum.
 - (iii) Deep breathing and coughing or huffing is used to prevent pulmonary complications.
- a. Reinforce the value of deep diaphragmatic breathing techniques for pulmonary ventilation, especially when exercising, and relaxed breathing techniques to relieve stress and promote relaxation.
 - b. The woman should wait at least 6 to 8 weeks before resuming vigorous exercise. Emphasize the importance of progressing at a safe and controlled pace and not expecting to be at her prepregnancy level.

High Risk Pregnancy

Definition

A pregnancy that is complicated by disease or problems that put the mother or fetus at risk for illness or death, conditions may be pre-existing, be induced by pregnancy, or be an abnormal physiologic reaction during pregnancy.

The goal of medical intervention is to prevent preterm delivery, usually through use of bed rest, restriction of activity, and medications, when appropriate.

Guidelines Precautions in High Risk Pregnancy:

1. All exercise programs for high risk population should be individually established based on diagnosis, limitations, physiotherapy evaluation and consultation with the physician.
2. Some exercise especially (Abdominal exercises) may be stimulate uterine contractions, and, therefore, discontinued.

3. No Valsalva maneuvers should be allowed.
4. Exercise should be smooth, slow, simple & should require minimal exertion.

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