EXERCISES DURING PREGNANCY: DIABETES AND HYPERTENSION

Chief Physiotherapist ,
Menara Medical Centre.
Email: jespalcoolsmile@gmail.com

NCDs represent the biggest threat to women's health worldwide, increasingly impacting on women in developing countries in their most productive years. NCDs during pregnancy can increase the risk of spontaneous abortion, stillbirth, congenital malformation, birth injuries, neonatal hypoglycaemia, infant respiratory distress syndrome, and being large for gestational age (Kapur, 2015)[1].

Since 1990, the global prevalence of obesity has more than doubled and it is young women of child bearing age who are bearing the greatest burden. Recent data suggests that between 1975 and 2014 the age standardised global prevalence of obesity increased from 6.4% to 14.9% in women, with the average body-mass index (BMI) increasing by 0.5 kg/m2 per decade[2]. Over the same period, diabetes rose from 5.0% to 7.9% among women[3]. Recent global prevalence data for raised blood pressure appears to tell a different story, falling from 26.1% in 1975 to 20.1% in 2014 but distributed disproportionately, high in low and middle income countries.[4]

In 2015, there were an estimated 199.5 million women with diabetes. By 2030, this number is expected to rise to 313.3 million, and 92% of cases of hyperglycaemia in pregnancy occur in Low and Middle Income Countries. Gestational diabetes mellitus (GDM) is a severe and neglected threat to maternal and child health. The prevalence of hyperglycaemia in pregnancy increases rapidly with age and is highest in women over the age of 45.[5]

Gestational hyperglycaemia and high blood pressure are linked directly or indirectly to haemorrhage, hypertensive disorders, obstructed labour, infection and sepsis, the leading causes of maternal mortality. Women with gestational diabetes have an increased risk of developing type-2 diabetes later in life, a higher prevalence of metabolic syndrome, and an increased risk of cardiovascular disease (Bellamy et al., 2009).

The American Congress of Obstetricians and Gynecologists (ACOG) recognized that sedentary lifestyle is a major health risk for women and published its first guidelines for exercise during pregnancy in 1985, with the latest update published in 2015.[6]

Safety of Exercise in Pregnancy

A recent meta-analysis that included 2059 women showed that among normal-weight women with uncomplicated pregnancies, aerobic (stationary cycling, water aerobics, aerobic dance) and strength or toning exercise of moderate intensity (60%-80% of maximum age-predicted heart rate) performed 3 to 4 days per week (35-90 min/session; mean, ≈ 60 min) starting late in the first trimester (weeks 8-13 in 5 of 9 randomized clinical trials) or during the second trimester (weeks 16-22 in 4 of 9 RCTs) and lasting until the end of pregnancy was not associated with an increased risk for preterm birth (ie, <37 weeks) or low birth weight.[7] Exercise is also considered safe for women with risk factors such as chronic hypertension, gestational diabetes, or overweight/obesity. A meta-analysis of 722 women with at least 1 of these conditions showed that aerobic exercise (walking, stationary cycling, aerobic dance, water gymnastics) at moderate intensity (≤70% of heart rate reserve [HRmax minus resting heart rate]) and strength exercise was safe for the fetus.[8]

Benefits of Exercise during Pregnancy

Major benefit of exercise during pregnancy is the prevention of excessive gestational weight gain. A meta-analysis of 24 RCTs (7096 participants) found high-quality evidence that compared with standard care with no exercise, moderate aerobic exercise (walking, dance, aerobics) with or without diet was associated with a significant relative reduction in the risk of excessive gestational weight gain (mean risk ratio, 0.80 [95% CI, 0.73-0.87).[9]

Exercise during pregnancy also has been linked to decreased risk of Microsomia in new-born's, gestational diabetes, preeclampsia, caesarean delivery, low back pain, pelvic girdle pain, and urinary incontinence.[10]

Exercises when done in water (Aquatic exercises) benefits the pregnant women in many ways, the major effect of immersion is a redistribution of extracellular fluid into vascular space resulting in increase in blood volume[11]. This effect occurs rapidly and is proportional to the depth of immersion leading to decrease in systemic blood pressure.

In longitudinal studies of immersion exercise in pregnancy at 60% maximal oxygen consumption, it was found to be a safe activity, with advantageous effects on oedema, thermal regulation, and buoyancy, thus minimising the risk of joint injuries.[12] Furthermore, no adverse effects on the fetus have been reported to occur during water exercise in pregnancy.

Recommended exercises during pregnancy

Low impact Aerobic Exercise:

Walking, aerobic dancing, stationary cycling or swimming

Duration: 20-30 min

Frequency: 3-5 days/week

Intensity: Moderate (≤80% HRmax) Rate of Perceived Exertion (13-14 on Borg Scale) or the more practical talking test

Avoid: High intensity (>90% HRmax), strenuous exercise, Long distance running, exercises with risk of falls, impact of the body against hard surface, diving.

Strength Exercise (toning):

Resistance bands, dumbbells, body weight exercises involving large muscles

Duration: 15-20 min

Frequency: 3-5 days/week

Intensity: light to moderate loads (eg: 1-2 sets of 10-15 repetitions using 1 to 3 kg dumbbells)

Avoid: isometric exercises, Valsalva maneuver, frequent heavy weight lifting, hot yoga or pilates, supine position exercises

Pelvic Floor Muscle Training (Kegel):

Duration: 10-15 mins

Frequency: 3-5 d/wk

Intensity: 100 repetitions

Combination of low impact aerobics and strength Exercises (highly Recommended)

Aerobic dancing followed by use of dumbbell

Duration: 45-65 min

Frequency: 3-4 d/wk

Intensity: low to moderate

Avoid: High Intensity strenuous exercises, isometrics, Valsalva maneuver.

The exercise program is indicating for the period of end of first trimester (12 weeks) to end of pregnancy (38-39 weeks).[13]CEach Session must include an initial warm up and a final cool down period of 5 min each. The intensity of each exercise session should be individualized and can be monitored by using the Borg rating of perceived exertion (RPE)

scale (minimum score, 6 [very, very light exertion]; maximum, 20 [very, very hard exertion]). According to ACOG guidelines, pregnant women should exercise at a moderate intensity (RPE score 13-14 [somewhat hard]). A more practical method also recommended by ACOG to monitor exercise intensity is the talk test—as long as an individual can carry on a conversation while exercising, she usually will not be overexerting.[14] Conversely, bed rest is still prescribed for certain conditions in pregnancy despite limited evidence for therapeutic efficacy.

Pregnant Women with Diabetes, obesity or chronic hypertension should have individualised exercise prescription. In one study, arm Ergometer exercise three times a week for about 20 minutes a session at 50% maximal oxygen consumption resulted in normalisation of glycaemic control after four weeks in contrast with diet alone.[15]

Another Study included 41 women at 28–33 weeks gestation that, despite dietary treatment, had persistent fasting hyperglycaemia of 105–140 mg/ dl. Study control subjects were treated with insulin. The exercise patients performed moderate cycle exercise three times a week and maintained an active lifestyle for the duration of pregnancy. Through this regimen, the exercising patients maintained euglycaemia and did not require insulin.

The American Diabetes Association has endorsed exercise as “a helpful adjunctive therapy” for gestational diabetes when euglycaemia is not achieved by diet alone.[16] There is currently no information available on the effect of exercise on women with chronic hypertension. The standard of care for women with pregnancy induced hypertension is to limit physical activity.

Conclusion

Pregnancy should not be a state of confinement. Pregnant Women with NCD’s such as Diabetes, obesity or Hypertension should be carefully evaluated before recommending physical Exercise. Despite the fact that pregnancy is associated with profound anatomical and physiological changes, exercises have minimal risk and confirmed benefits for most women.

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