

NOVEMBER

2015

Vol 2, No 11 (2015)

**Sai Om Journal of Science, Engineering & Technology: A Peer Reviewed
International Journal (Online ISSN 2347-7555)**

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ISSN: 2347-7555

Published by: Sai Om Publications

Sai Om Journal of Science, Engineering & Technology
A Peer Reviewed International Journal

**THE EFFECT OF PHYSICAL EXERCISE TO PREVENT
ARTHROGRYPOSIS MULTIPLEX CONGENITA (AMC)
DISABILITY ON INFANTS**

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ABSTRACT

The purpose of this systematic review is to outline the effect of physical exercise to prevent Arthrogyrosis or Multiplex Congenital (AMC) disability on infants. This systematic review results show that, to prevent children at birth from Arthrogyrosis disability making the women be familiar with physical exercise in their life span before pregnancy will enables them to born child which is free from Arthrogyrosis rather than the treatments that are given after birth of child with Arthrogyrosis. In other words doing physical activities according to the principles of FITT before and during pregnancy of women is a better solution to reduce the exposure of Childs with Arthrogyrosis or Multiplex Congenital (AMC) at birth.

Keywords: Physical Exercise; Arthrogyrosis Multiplex Congenital (AMC); Disability; Infant

INTRODUCTION

Arthrogyrosis is the name given to a group of musculoskeletal disorders characterized by multiple joint contractures through the body that are present at birth. There are many causes for congenital limitations of the range of motion of a joint. Arthrogyrosis, also known as Arthrogyrosis Multiplex Congenita, or AMC, is a rare condition that describes congenital contractures that affect two or more different areas of the body that are present at birth. The muscles and joints affected are replaced partially, often completely, by fat and fibrous tissues (Shapiro & Specht, 1993). Arthrogyrosis is a non-progressive disorder that is indicated by decreased or limited fetal movement of the joints and extremities before birth. To be clear, arthrogyrosis is not a single disease. It has multiple etiologies, which has complicated both the understanding of the condition and results gained from treatments (Shapiro & Specht, 1993). The exact cause of arthrogyrosis is undeterminable, as studies suggest that the limitation of joint movement in-uterus may be the result of a variety of neurological or muscular deficits (Cevei & Stoicanescu, 2008). Certain skeletal defects and fetal crowding have also been shown to result in arthrogyrosis (Shapiro & Specht, 1993).

Arthrogyrosis is a condition of flexure of joints of the lower limbs more often than joints of the upper limbs. The limbs may be fixed in any position. However, the usual forms are the shoulders turned in, the elbows straightened and extended, the forearms turned with the palms outward (pronated), and the wrists fixed and deviated upward with the fingers curled into the palms. The hips may be bent in a flexed position and turned outward (externally rotated), and the feet usually turned inward and downward. The spine often evidences scoliosis, the limbs are small in circumference, and the joints appear large and have lost their range of motion. It is now widely accepted that arthrogyrosis

multiplex congenita (AMC) is not in itself a disease but is secondary to any factor that interferes with fetal movements (Dubowitz 1978, Hageman and Willemse 1983, Hall 1981, Swinyard 1982). A research on arthrogryposis has shown that anything that inhibits normal joint movement before birth can result in joint contractures. This means the baby does not move around inside the womb as much as normal. Starting in early pregnancy, moving helps a baby's joints, muscles and tendons develop. If a baby doesn't move much, these parts may not develop well, and extra tissue may form in the joints, making movement harder. Arthrogryposis could be caused by genetic and environmental factors. In principle: any factor that entails fetal movement of the fetus can result to congenital contractures. 70-80% of the cases of arthrogryposis are caused by neurological abnormalities. Most of these are underlying of a genetic syndrome or the result of environmental factors. There is currently a lot of research on prenatal diagnosis. The diagnosis can be made prenatally in approximately 50% of fetuses presenting arthrogryposis. Therefore; the aim of this systematic review of scientific publications concerning on the effect of physical exercise to prevent Arthrogryposis disability on infants.

METHOD

Under this part the appropriate studies was conducted in three ways. Firstly, searching of articles was made based on the research topic key terms. Secondly, find out the relevant abstracts. Thirdly, an evaluation of the methodological quality of the selected studies was performed by reviewer. A total of 31 titles were selected and screening by title. In addition to this the reviewer was avoid duplication and evaluated based on a set of criteria. 25 studies were fit the criteria and Ultimately 12 surveys satisfied the sever selection criteria.

DISCUSSION

Abnormalities of muscle structure or function have been associated with reduced fetal movement and contractures. For example, patients born with congenital muscular dystrophy or severe myotonic dystrophy often have multiple contractures; especially of the lower extremities (Banker, 1986; Hall, 1997). Contractures can be seen in children with neurogenic conditions such as Spinal muscular Atrophy or neural tube defects (Burglen, et al., 1996; Hall, 1997). Joint or tendon abnormalities that restrict movement can cause contractures (Gordon, 1998; Hall, 1997). A number of different factors can limit the space available for a fetus to move around, possibly resulting in congenital contractures (Gordon, 1998; Hall, 1997; Wynne-Davies & Lloyd-Roberts, 1976; Wynne-Davies, Williams, & O'Connor, 1981). For example, pregnancies complicated by oligohydramnios, amniotic bands, uterine fibroids, and other abnormalities of uterine structure have all been associated with joint contractures. The high rate of arthrogryposis in twin pregnancies is thought to be related to the reduced fetal space. Moreover, the higher prevalence of monozygotic twins who are discordant for amyoplasia points to vascular compromise related to shared placental networks. If blood supply is impaired, a fetus may develop neural, muscular, or other structural defects that can cause congenital contractures (Gordon, 1998; Hall, 1997; Hall et al., 1983; Reid, et al., 1986). Maternal health conditions, including multiple sclerosis, diabetes mellitus, myotonic dystrophy, or viral infections, have been associated with arthrogryposis (Gordon, 1998; Hall, 1997; Hall, Reed, & Driscoll, 1983). Bleeding during pregnancy, physical trauma, such as that sustained during an automobile accident or attempted pregnancy termination, and drug exposures, including curare, alcohol, and phenytoin, have also been reported in mothers of children with arthrogryposis (Hall, 1997; Wynne-Davies & Lloyd-Roberts, 1976; Wynne-Davies, et al., 1981). Maternal hyperthermia from febrile illness or use of hot tubs has been suggested as a potential cause of arthrogryposis, although the association appears weak and has not been confirmed (Benca & Hogan, 2009; Gordon, 1998; Hall, 1997).

Maternal Myasthenia Gravis is also another main cause of arthrogryposis. That is an autoimmune disorder characterized by progressive muscle weakness due to loss of nicotinic acetylcholine receptor (nAChR) activity at synaptic surfaces of neuromuscular junctions (Spillane, Beeson, & Kullmann, 2010). Polizzi, et al. (2000) reviewed 32 affected children from 13 mothers with Myasthenia Gravis and found that most mothers were unaware they had the condition until during or after the pregnancy. Children with arthrogryposis may have major feeding difficulties in infancy, *i.e.* problems with

chewing, sucking, and swallowing, sometimes requiring tube feeding. These problems are in many cases related to structural abnormalities in the jaw and tongue. Secondary to this chest infection, constipation, poor growth, and also language problems can be seen (Banker, 1986; Hall, 1997). But to reduced the risk of Arthrogryposis Weight bearing activity is essential for bone health (Hall, 1981; Hall, Reed, & Driscoll, 1983).Therapy of the wrists, hands, and fingers should begin at birth to stretch the tendons and stimulate the muscles, and splints may be used for severe wrist contractures Shoulders should also be exercised to increase strength.(Hall, Reed, & Driscoll, 1983).

All most all scholars stated that Physical therapy, splinting, and orthopedic surgery are the main treatment methods in arthrogryposis with the correct genetic diagnosis since it's treatment needs may vary .More over the early physical therapy is important to avoid further muscle atrophy and, for the same reason, splinting combined with physical therapy is mostly preferable Hall(1981, 1997) stated . The first three to four months of life are especially valuable in activating and stimulating muscle function and in stretching contracted joints .Daily passive stretching and serial splinting in infants has been found to increase function (Gordon, 1998; Wynne-Davies & Lloyd-Roberts, 1976; Wynne-Davies, Williams, & O'Connor, 1981). More over to overcome the problems of Arthrogryposis special after birth, some researchers were recommended that Passive flexion and extension of the fingers must be done carefully to prevent tissue damage. Stretching is usually done for all joints exhibiting limitation, even those with little or no motion. Increased joint motion is needed to improve positioning for function and to allow for greater movement that can be achieved through strengthening, substitution, or orthopedic surgery. And also Isometric muscle strength; like a physical activity crawling, rolling, transferring, walking, running, stair climbing, and bicycle riding are important for arthryogrposis disability to improving strength and endurance; posture (seated or standing), balance, and coordination.

THE REVIEWER CONCLUSION

Based on the different scholar diagnosis the reviewer of this were concluded that, 100% of arthryogrposis is create (happening) at pregnancy stage but the treatment almost focus by physicians after the birth of the child. Doing physical activities before pregnancy is more important than during pregnancy. During pregnancy women's should be more active through physical activity than giving treatment for their child after birth with arthryogrposis .The occurrence of arthryogrposis is all most at pregnancy stage due to any difficulty of motion problem for infants at their mother womb. Therefore rather than giving treatment for the kids those who have arthryogrposis disability it is better to give proper care for the mother before and during pregnancy by advising to do physical activity according to FITT principles. The pregnancy women must be doing at least 150 minutes of moderate-intensity aerobic activity per week for those who have not been engaged in regular exercise before pregnancy. Women who were participated regular exercise before pregnancy recommend 30 minutes or more of moderate to vigorous exercise a day. women's by engaged in to the varies physical activities through their life span can advantageous at their pregnancy time to transfer enough oxygen to their baby; decrease discomforts such as nausea and muscle cramps ; keep weight gain at a healthy rate and avoid gestational diabetes; provides stress release and Decreases the risk of spontaneous abortion. Some of sport activity that can be recommending before and during women pregnancy to not be exposure new born baby with arthryogrposis disability are, Swimming; Racket Sports; Table tennis ;Badminton ;Cycling; Aerobic Exercise(low impact aerobics); Yoga activity; Cardiovascular fitness; Calf stretches exercise and like. In short by engaging women's in to different body movement before and during pregnancy is more preferred to reduce the occurrence of arthryogrposis in the newly born child. Therefore any organization that exercise on health should have to give greater attention to be make familiar the women's in varies physical activity through their life span since to reduced the victim of their child with arthryogrposis.

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