INTRODUCTION

Leg cramps are a common complaint in late pregnancy as a result of normal physiological changes due to hormonal changes and the influence of the developing pregnancy, it is not dangerous but can cause some discomforts as pain, feeling of heaviness, night cramps, jumpy feeling in legs which can interfere with daily living activities and night sleeping.

Leg cramps affect up to half of all pregnant women ***(Young, 2006)*** during second half of pregnancy ***(Coppin et al., 2005)***. Probably because the leg muscles are tired from carrying around extra weigh, typically the cramps begin during the second trimester, get worse as the pregnancy progresses and are worse at night. They may be aggravated by the pressure that the expanding uterus puts on the returning blood vessels from the legs to the heart and the nerves leading from the trunk to the legs ***(Young, 2002).***

Leg cramps are sudden tightening muscles, the muscles may tighten for a variety of reasons, such as injury, muscle strain, or staying in the same position for a long period of time ***(Lowdermilk et al., 2006).*** Blood circulation problems or pressure on the nerves in the spine can also cause cramp-like pains in legs.

Attention should be directed at controlling predisposing and risk factors that are potentially included, life style (as over

standing or sitting) lack of fluids, diet low in calcium and magnesium ***Angie (2005).***

Stretching exercises can be relieved or controlled leg cramps, it will help to warm the muscles and to decrease tension in the tendons and ligaments. It will also help to maintain flexibility, which is diminished during pregnancy, and it increases blood circulation to the muscles which helps in its relaxation prevent muscles from tightening, and make them feel looser and more relaxed ***(Angie Younce, 2005),*** It is consider also as a cheap, easy and readily available technique, moreover, it decrease patient exposure to more medication and its side effects, according to Riley and ***Antony (2005)***. Because of pharmacological treatment for leg crams has potentially serious unwanted effects ***Young (2006)***. So educate climate to stretching exercises will be recommended by ***Angie (2005).***

And in another important view adolescences are the largest category of society they increase more than one milliard all over the world (1.2 milliard equal 1/5 population) and adolescence pregnancies faces many barriers to receiving adequate prenatal care as fearful of care - givers, avoid prolonged interaction wit adult, lack family support or transportation to regularly attend prenatal visit, so researches in these category is very important to relief some difficult which faces them to avoid risk of complications such as premature labor higher neonatal mortality and anemia which can cause malnutrition and lead to leg cramps***(Rice, 2006).***

Nurse's role is responsible for physical preparation (as exercises to promote the pregnant women well being), education in antenatal classes and motivation of pregnant women regarding self care aspect ***(Parson, 2004),*** also shared with health team to ensure high quality of care promoting to the pregnant women for motivation, awareness regarding the importance of antenatal care ***(Dean Raffelock, 2005).***

JUSTIFICATION OF THE PROBLEM:

Leg cramps represent up to half of all pregnant women ***(Young, 2006),*** in ***Egypt survey (2000),*** the annual statistical report revealed that 34 % of pregnant women were suffering from leg cramp ***(WHO, 2002).*** Leg cramps is a problem that threaten woman's activities during pregnancy, so it considered one of the leading causes of maternal morbidity, it distribute their pattern of sleeping, effect the quality of working, through my work I observed the increase rate of pregnant women whose complaint of leg cramps, especially in the adolescences because they are the largest category of our society and there was a big number of the early marriage in Aswan. A few studies suggested that stretching exercises has a significant role to improve the quality of woman's life so. It is important to research in this field.

Adolescence pregnancies result in numerous personal, social, health and financial problems ***(Sharon & Emily, 2006),*** one of this problem malnutrition, so leg cramps are more common in Adolescence. The majority of health care providers

neglect the nursing intervention regarding to leg cramp during pregnancy.

*AIM OF THE STUDY:

The aim of this study is to assess the effect of Stretching exercises on reliving sudden leg cramp for adolescences pregnant women.

* HYPOTHESIS:

Pregnant women who follow proposed Stretching exercises will feel more comfort (less pain feeling and sleep disturbance) than those who do not.

LEG CRAMPS DURING PREGNANCY

During pregnancy, a woman's body undergoes extreme chemical changes in order to accommodate the new life inside of her. One of these changes is a difference in how the body accepts and processes nutrients. An excess of phosphorus or a lack of potassium can bring about leg cramps. Another common cause of leg cramp during pregnancy is the weight gain, which is obviously unavoidable.

According to ***Riley and Antony (2006)*** a leg cramp is a pain that comes from a muscle in the leg. It is due to a muscle spasm which is occurring when a muscle contracts too hard. It usually occurs in one of the calf muscles, below and behind a knee. The small muscles of the feet are sometimes affected. A calf strain (torn calf muscle) occurs when part of the muscle of the lower leg (gastrocnemius or soleus) is pulled from the Achilles tendon. It is similar to an Achilles tendon tear or rupture, but occurs higher up in the back of the leg ***(Hirai, 2004).***

Leg cramp can be defined as involuntary, unpleasant, often painful sensation caused by contraction or over shortening of muscle and it is a strong, painful contraction or tightening of a muscle that comes on suddenly, lasting from a few seconds to several minutes. Soreness in the muscle may last for hours after the hard, tense cramp has stopped ***(Susan, Scott, 2007).*** Leg

cramp usually occurs in the calf but also in other areas of the leg commonly disturb sleep ***(Young & Jewell, 2006).*** Cramps can occur in thigh, foot or lower part of the leg when patient was in bed or resting ***(Hirai, 2004).*** During the second and third trimesters, painful leg cramps arise, particularly at night or while sleeping. And may also have a jumpy feeling in legs.

Leg cramps tend to occur more often during the last months of pregnancy, The most common time for these leg cramps to appear is just after lying down to go to bed. They can also occur after sitting for a long period of time or after a day without much movement ***(Young and Jewell, 2006).***

Incidence of leg cramp:

World wide 50.9% complained at least once of muscle cramps during pregnancy. Muscle cramps were noticed most often in the second half of pregnancy, gravida with muscle cramps were on the average older and of higher parity; there was no relationship between muscle cramps and complications during pregnancy or unfavorable fetal outcome ***(Riss et al., 2004).*** The statistics of the present study revealed that(the flow rate of pregnant women in antenatal clinic during October 2007 was 140) the incidence of leg cramp from this number was 48%, and 63% of them their leg cramp appeared after 26^{th} week of pregnancy, and 40% of them had experienced the symptoms twice / week, also 60 % of them suffered from painful cramps only during night –time. According ***Valbo and Bohmer (2003)*** in the result of research revealed that 45% had suffered from

leg cramps during pregnancy. Among 54% of them the cramps appeared after the 25th week of pregnancy. 76 % of the women had experienced the symptoms twice per week or less often; 81% of them suffered from painful cramps only during night-time. We conclude that leg cramps are still a common symptom in pregnancy and may compromise sleep and hence the ability to work.

Causes of leg cramp during pregnancy:

Muscle cramps is caused by sudden contraction of gastrocnemius or soleus muscle, with the foot in a passively planter flexed position, from which involved muscles shorten beyond the physiologic limit into a painful cramps ***(Taylor et al., 2001 and Young, 2002).*** During pregnancy, most of the leg cramps are caused from the fatigue of carrying around extra weight that is put on while pregnancy. Cramps can also be aggravated by the expanding uterus putting pressure on blood vessels that return blood from legs to heart and the nerves leading to legs. Leg cramps can occur at any time, but will most likely notice them at bedtime ***(Young, 2002).*** There are many factors which may contribute to the increased tendency toward leg cramps in pregnancy, and there is no agreement among doctors as to which factors are the more important causes among them ***(Angie Younce, 2005).***

* Primary cause (Idiopathic leg cramps):

In most cases the cause is not known. One theory is that cramps occur when a muscle that is already in a shortened

position is stimulated to contract. As the muscle is already shortened, to contract further may cause the muscle to go into spasm. This commonly happens at night in bed as the natural position we lie in is with the knees slightly bent (flexed), and with feet pointing slightly downwards. In this position the calf muscle is relatively shortened and prone to cramps. This theory explains why stretching exercises may cure the problem during night ***(Ravinder Chadha, 2008).***

**** Secondary causes****:*

In some cases, the cramps may be a symptom of another condition or problem. There are six basic causes of cramping. For example:

Low blood levels of minerals in the body during pregnancy for either calcium or magnesium (especially for adolescents where they need calcium for both blood and bone maturing) ***(Rice, 2006)***, directly increase the excitability of both the nerve endings and the muscles they stimulate. This may be a predisposing factor for the spontaneous "true" cramps commonly noted during pregnancy. Low levels of calcium and magnesium are common in a normal pregnancy (especially in the later months of pregnancy), unless these minerals are supplemented to the diet ***(Susan Scott 2007).*** Cramps are seen in any circumstance that decreases the availability of calcium or magnesium in body fluids, such as from diuretics, hyperventilation (over breathing), excessive vomiting, inadequate calcium and /or magnesium in the diet, inadequate calcium

absorption due to vitamin D deficiency, poor function of the parathyroid gland (a tiny gland in the neck that regulates calcium balance) and others ***(Ravinder Chadha, 2008).***

Hypokalemia (a low level of potassium) and hypocalcaemia (a low level of calcium) those disturbance arises as the body loses large amounts of interstitial fluid through sweat and excessive vomiting, this interstitial fluid is composed mostly of water and table salt (NaCl), the loss of osmotically active particles outside muscle cells (NaCl) leads to a disturbance of the osmotic balance and swelling of muscle cells as these contain more osmotically active particles, this causes the calcium pump between the muscle lumen and sarcoplasmic reticulum to short circuit and the calcium ions remain bound to the tropomyosin and the muscle contraction is continued, ***(Ricardo et al., 2007).***

Blood circulation problems or pressure on the nerves in the spine can also cause cramp -like pains in the legs. The reasons for increased leg cramps during pregnancy in this case aren't clear. They may be caused by changes in blood circulation during pregnancy which caused by the stress on leg muscles of carrying the extra weight of pregnancy and /or the pressure of the growing baby on the nerves and blood vessels that go to legs. Alterations in calcium and magnesium, not only because of the altered physiology of pregnancy but also because of alterations in circulation due to swelling and changes in blood volume.

Hyper flexion: Exercising, injury, or overuse of muscles (over-exertion). A muscle that is very tired, not well - stretched, or held in poor posture may develop a cramp. Muscle cramps occur as a result of the stimulation of reflex and through hyper excitation of the motor neurons in any leg nerve or in spinal cord ***(Riley and Antony, 2006).*** Increased exertion on muscles also due to changes in weight and center of gravity later in pregnancy ***(Coppin et al., 2005)***. In other words, leg muscles those do just fine when non- pregnant, but prove to be out of shape with the increased physical demands of pregnancy ***(Dean Raffelock, 2005).***

Dehydration: caused by exercising during hot weather or exposure to large changes in temperature often causes "exercise cramps" or "heat cramps." Muscle cramps can be caused by dehydration from vomiting, diarrhea, or not drinking enough fluids.

Inadequate oxygenation: cramps from poor oxygenation can be improved by rapid deep breathing In the case of inadequate oxygenation, excess lactic acid, produced by anaerobic respiration builds up and stresses the muscle

Other medical conditions, such as blood flow problems (peripheral arterial disease), kidney disease, thyroid disease, and multiple sclerosis. Also limb circulation may be disturbed in patients with muscle cramps due to leg venous hypertension some medicines also can cause cramps as a side - effect, or make cramps occur more often ***(Sydney, 2006).***

Staying in the same position for a long period of time can also be aggravated leg cramps. It has been suggested that leg cramps may be more common in affluent sedentary societies, where muscle use and stretching is less common ***(Richard et al., 2006).***

*** Signs and Symptoms of leg cramps:**

There is sudden pain at the back of the leg, swelling or bruising in the calf muscle, and difficulty standing on the toes, this injury happens during acceleration or changes in direction. The torn calf muscle may spasm, and contract forcefully. The toes will point down ***(Elezabith Quinn, 2008).***

Calf strains may be minor or very severe and physician grade the injury according: In *Grade 1*, the muscle is stretched causing some small micro tears in the muscle fibers. Full recovery takes approximately two weeks. In *Grade 2*, there is partial tearing of muscle fibers. Full recovery takes approximately 5-8 weeks. In *Grade 3,* this is the most severe calf strain with a complete tearing or rupture of muscle fibers in the lower leg. Full recovery can take 3-4 months.

ANATOMY OF THE LOWER LEG

Bones and Joints

The Lower Leg is comprised of two long bones. The tibia is the larger of the two, and is located toward the middle of the lower leg (medially), the fibula is the smaller bone and it is located on the outside of the lower leg (laterally).

Muscles

While there are many muscles located in the lower leg, three are most well know. The muscles that make up the calf – the gastrocnemius and soleus – is the largest muscle located on the back of the leg below the knee It also contains plantaris muscle. The gastrocnemius is shorter, thicker and has two attachments (inner and outer). It is the most visible of the calf muscles. The anterior tibialis is on the front lower leg (related to shin splints).

The soleus lies underneath. These three muscles attach to the denosin tendon, they all aid with plantar flexion. The calf muscle. The tendon that connects the calf muscles to the heel bone is known as the Achillie's tendon it is located in the lower leg. When the calf muscles contract, it plantar flexes the foot or points the toes. When calf muscles become tight, the risk of muscle or Achillie's tendon tears and injury increases. ***(Ravinder Chadha, 2008).***

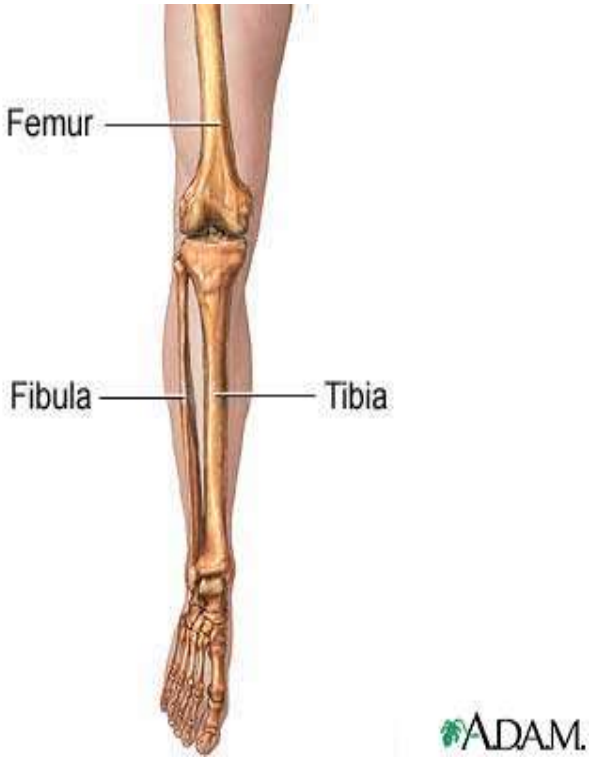


Figure (1): Normal anatomy of the Lower Leg Bones. Includes tibia, fibula, femur, patella, ankle and foot bones. ***www Amazing pregnancy (2006).***

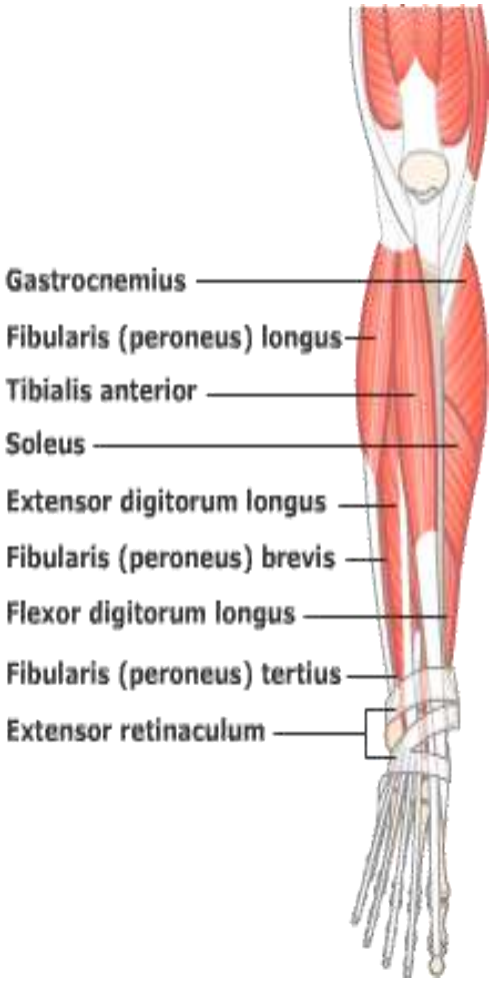
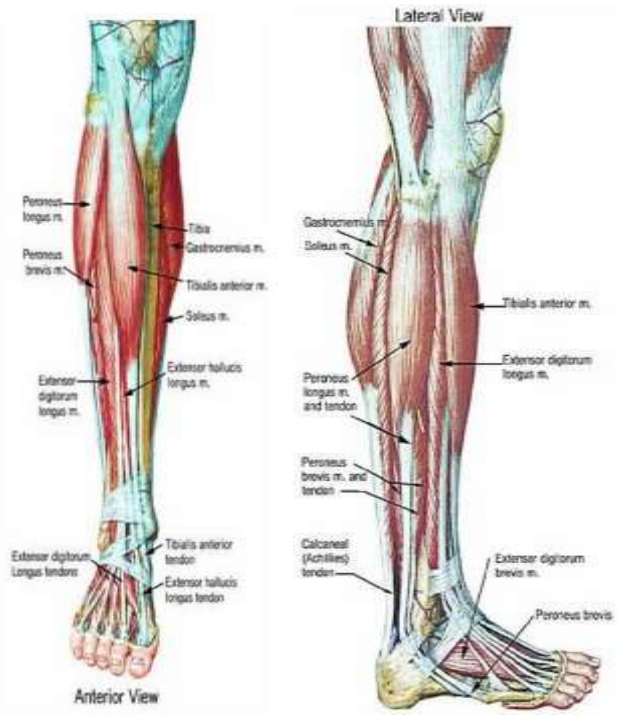


Figure (2): Normal anatomy of the Lower Leg Muscles. ***http://www.getbodysmart.com/ap/muscularsystem/footmuscles/tibialisanterior/tutorial.html July9.2007.***



(A) **(B)**

Anterior view **Lateral view**

Figure (3): Muscles and tendon of the Lower Leg

http://www.getbodysmart.com/ap/muscularsystem/footmuscles/tibialisanterior/tutorial.html July9.2007