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Review Article

Impact of sleep disturbance on maternal and foetal outcomes

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ABSTRACT

Sleep is a vital factor that regulates the physiology of the body in various aspects. During pregnancy, sleep problems are common. Sleep deprivation has been suggested by previous research to be associated with more adverse birth outcomes that impact both maternal and foetal outcomes. The purpose of this review is to analyse the current evidence regarding the effects of sleep deprivation during pregnancy. Quantitative studies were included and for this review, Google Scholar, PubMed and CINAHL were used to perform a literature search. A total of 38 articles were chosen for this review. Sleep deprivation may increase the risk of adverse birth outcomes in female residents due to long work hours. The initial approach to treating sleep disturbances during pregnancy is non-pharmacological. Sleep position is a major component that influences sleep quality and pregnancy outcome. Poor sleep hygiene during pregnancy can lead to a worsening of the mother, especially in the third trimester, which can have an impact on the outcome of the pregnancy. Maintaining good sleep hygiene is crucial. It has been proven by research that several non-pharmacological measures can enhance the circadian cycle. Further research with longitudinal study designs is required to examine the effect of sleep deprivation on adverse effects on the mother and foetus. Furthermore, additional research is needed to confirm the impact of sleep deprivation on the postpartum period.

Keywords: Pregnancy, Sleep initiation and maintenance of sleep, Sleep apnoea, Restless leg syndrome, Hormonal impacts, Maternal outcome, Foetal outcomes, Changes in pregnancy, Sleep positions

INTRODUCTION

Sleep deprivation has become a major societal concern in the developing competitive world. The detrimental effects of sleep imbalance cause changes in the bio-behavioural process that is essential for the human body to have a proper performance. To date, despite the multiple competing demands women face in modern society. 75% of sleep research has been conducted in men.[1] Pregnancy often result in sleep problems.[2] The incidence of sleep disturbance during pregnancy occurs about 5-38% of women in their early pregnancy.[3] The alteration in sleep duration and quality may result from a variety of hypothesised and interconnected mechanisms, including shifts in hormone levels, which influences physiologic, metabolic, psychological functions.[4] During the last eight weeks of pregnancy between 52% to 61% women experience reduced and poor-quality sleep with a higher incidence among women with mental condition or a history of smoking.[3] This article reviews what is currently known about the relationship between sleep duration during pregnancy and feto-maternal outcomes.

PREVALANCE OF SLEEP DEPRIVATION

The National Sleep Foundation has suggested that the healthy adults need at least seven hours of sleep per night.[5] Sleep deprivation will be referred to here as alteration of individuals from obtaining their habitual amount of sleep within a 24-h period. Women today have grown to occupy a more prominent place in the work force, without reducing most of their responsibilities at home. Women

struggle to balance family and work demands are increasingly time-pressed and pulled in multiple directions with work, play groups, household responsibilities, care of family members, school activities, and other responsibilities. Average nightly sleep duration has declined even more over the past several years. A cross-sectional study design was conducted among 415 pregnant women at Jimma Medical Centre (JMC). The study subjects were recruited using a systematic random sampling technique. Pittsburgh sleep quality index (PSQI) was used to assess sleep quality using face-to-face interviews. The prevalence of poor sleep quality among pregnant women was found to be 30.8%.[6] This study found a high prevalence of poor sleep quality among pregnant women.

SPAN OF SLEEP

Sleep patterns and contributing factors in women in the childbearing years have received increased research interest. Nevertheless, few have focused on pregnancy. Most women notice sleep alterations during pregnancy, usually in the form of lesser hours of sleep and more awakenings. In a study investigated by Hedman and coworkers among 325 pregnant women found that the mean hours of total self-reported sleep per 24 hours before pregnancy was 7.8 hours. Total sleep time increased during the first trimester to 8.2 hours, decreased during the second trimester to 8.0 hours, and remained unchanged from antepartum sleep time at 7.8 hours in late pregnancy.[1] The change in sleep needs is due to the physical and hormonal changes of pregnancy.

First trimester

Sleep problems and patterns starts changing during the first trimester which is influenced by the increase level of progesterone a reproductive hormone throughout pregnancy. The progesterone levels are 10 times greater at 36 weeks of pregnancy rather than peak menstrual cycle levels. The mother usually sleeps during the daytime due to fatigue as well as nausea and vomiting which is common in the first trimester. Usually, pregnant women reported on an average increase of 0.7 hours of sleep duration compared to the pre-pregnancy period. Increase of more than 30 minutes sleep at night was noted around 11 to 12 weeks of gestation. During first trimester stage 1 non-rapid eye movement sleep increases whereas in stage 3 it decreases, and sleep efficiency also decreases as compared to the pre-pregnancy period.

Second and third trimester

The total night-time sleep usually falls in the late second trimester between 23-24 weeks of gestation. Stage 3 non rapid eye movement sleep is increased as compared to the first trimester which corresponds to interrupted sleep due to nocturnal gastroesophageal reflux disease (GERD). Majority of women have sleep difficulties in the third trimester. Less than 2% report awakening during the night. Reduction in the percentage of rapid eye movement sleep and stage 3 non rapid eye movement sleep and an increase in stage 1 non rapid eye movement sleep. There is an increased in wake time, after sleep onset and reduced nighttime sleep as compared to the first 2 trimesters. There is no shift in delayed sleep phase or advanced sleep phase with melatonin levels during the day. 98% of women experience sleep problems in the 3rd trimester. Rise in stage 1 non rapid eye movement and reduction in stage 3 and rapid eye movement parts of sleep. Despite these changes and reduced sleep time as compared to first 2 trimesters, total sleep time it normalizes to the pre-pregnancy levels. There is no evidence of changes in circadian rhythm with melatonin levels showing a diurnal rhythm. In 3rd trimester, sleep disturbances are due to general discomfort caused by backache, urinary frequency, foetal movements, GERD and leg discomfort.[7]

FACTORS AFFECTING SLEEP DURING PREGNANCY

It is common for pregnant women to experience changes in the quality and duration of their sleep. The contributing factors for the fragmented sleep are in wide spectrum. The factors can be aggregated as sociodemographic factors, anatomical and physiological factors.

Sociodemographic

Sociodemographic factors among pregnant women are a prime factor which cause aberrant in sleep cycle. Several studies highlights that the factors affecting sleep during pregnancy include, low educational status, unemployed, presence of family issues, issues at work and her spouse, first pregnancy and unplanned pregnancy influence maternal sleep quality.[5]

A prospective cohort study was conducted in China among 1152 pregnant women to assess the associations of sleep quality in the second trimester with antenatal stress, antenatal depression, and postnatal depression. The tools used were Pittsburgh sleep quality index (PSQI), pregnancy pressure scale (PPS) and Edinburgh postnatal depression scale (EPDS). Poor sleep quality index (PSQI scores ≥5) was associated with antenatal stress status, antenatal depression status and postpartum depression status after adjusting maternal age, body mass index (BMI), gestational age, smoking, educational level, annual household income and social support. The study concluded that the association of poor sleep quality (PSQI scores ≥5) in the second trimester with postnatal depression status was significant among women more than or equal to 30 years old but not among women less than 30 years old after adjusting covariates above.[8]

A study conducted at Jimma Medical Centre concluded that older age, gravidity, depression, and stress were associated with poor sleep quality. It is better to have routine sleep pattern screening and teach sleep hygiene practice for pregnant women.[6]

Anatomical

There are momentous anatomical changes which occur during pregnancy such as increased weight (up to 20% more than pre-gestational weight) additionally the growing foetus in the womb increases the uterine volume which result in diaphragm elevation leading to respiratory impairment and changes in posture which affects both sleep initiation and continuity. Pain during pregnancy can have a significant negative impact on day-to-day functioning affecting ability to work and sleep.[2] Studies conducted by Saxena concluded that more than one-third of pregnant women suffer from back pain at night, which results in a chronic sleeplessness.[9]

Furthermore, study stated that about 30% of pregnant women experience decrease in their physical activity because of back pain. Lower back pain brought on by pregnancy might significantly raise the risk of stress. Despite being one of the most often reported prenatal diseases, low back and pelvic discomfort still lacks a clear aetiology and pathology.[10]

Diagnostic limitations during pregnancy appear to be the cause of our lack of understanding of these issues. It is challenging to measure reliably postural and spinal changes at the time of pregnancy, since most imaging studies cannot be used due to the radiation burden.[11] Pain located in the lumbosacral region and pelvis can be caused by various changes occurring during the pregnancy. Gestational weight and its asymmetrical distribution cause that pregnant women arch their backs to move the centre of mass of the upper body backward what increases the load on the facet joints. Growth of the uterus causes lengthening of abdominal muscles and may allow lumbar lordosis to increase.[12]

Moreover, pregnancy-related lower back pain may occur due to dysfunction of the pubic symphysis, sacroiliac joints or hip joints, hormonal loosening of the pelvic ligaments, or peripheral circulatory disorders.[13] Several risk factors have also been identified including the previous history of lower back pain and low satisfaction of the job.

Physiological

The primary physiological factors include cardio-respiratory such as increased pulse rate, blood pressure and respiratory frequency. These changes cause fatigue and exhaustion which is experienced by the mother. The biochemical markers, such as abnormal glucose and lipid levels, have been linked to poor sleep quality and the relationship between hyperglycaemia and gestational diabetes during pregnancy changes the sleep pattern.[14] Slower digestion due to the increase of gastric-emptying time, constipation and gastroesophageal reflux impacts the sleep cycle. Besides, nocturnal micturition also causes sleep fragmentation. The physiological factor can be further clubbed as hormonal and psychological aspect.

Hormonal

Most of the changes occur due to changes in the body's internal clock located in the hypothalamus, which constitutes about 20,000 cells that form the suprachiasmatic nucleus (SCN). This regulates the circadian rhythm. The rhythm is altered under the influence of certain release of hormone. Changes in production of hormones, such as melatonin and cortisol, may also play a role in disrupted sleep-in older adults.[15] Hormonal changes are compelling factors which affect sleep quality and physiology of sleep. Hormones like HCG, Progesterone, oestrogen, cortisol, prolactin, increases during pregnancy influences sleep.[16] HCG hormone is elevated during the initial days of first trimester. Increased amount of HCG hormone causes nausea and vomiting which affect the sleep quality.[2] Despite the imperative need of progesterone hormone which triggers ovulation and maintenance of pregnancy, it also promotes sleep which stimulates the brain to produce a neurotransmitter called gamma- aminobutyric acid (GABA). The amino acid GABA helps the brain cells to communicate with each other. Their main roles are to lower brain activity which helps to reduce stress, balance the mood, and promote sleep. GABA helps to promote sleep and relax.[17] However in condition like ectopic pregnancy there is notable reduction of progesterone which affects the GABA cycle.

Oestrogen plays a significant role in the sleep wake cycle by the metabolism of serotonin, a neurotransmitter. In fact, oestrogen also plays a vital role promoting conducive sleep during pregnancy. Pregnancy is maintained with the help of oestrogen during pregnancy. However, low oestrogen level during pregnancy which is associated with conditions such as polycystic ovary syndrome, thyroid disorders, low body weight, congenital conditions such turner syndrome and primary ovarian insufficiency affects sleep wake cycle.[18] A proposed mechanism which links poor sleep to certain adverse pregnancy outcomes is elevated maternal cortisol. Cortisol is secreted from the hypothalamic-pituitary-adrenal (HPA) axis in a circadian pattern. HPA mechanism changes dramatically over the period of pregnancy. Total cortisol level increases across gestation reaching levels at peak at the third trimester.[19]

Psychological

Anxiety and stress are the factors that affect psychological mechanisms which have an impact on sleep duration and quality, especially in primiparous women.[20] A mixed-methods study was conducted among 418 pregnant women they completed the PSQI, measures of pregnancy-related physiological factors and provided details about their sleep environment. They also rated perinatal depression, anxiety, and socioeconomic status. Women with history of psychopathology, sleep disturbance was significantly related to anxiety and depression symptoms predicting clinically significant antenatal depression.[21] Frequent urinations, body aches and sleep positions are the major

causes of poor sleep during pregnancy as it depends on trimester. Factors such as gestational age, maternal age, income, parity, and race have been associated with changes in sleep patterns during pregnancy. Obesity and gestational weight gain (GWG) also show a correlation with worsening sleep quality.

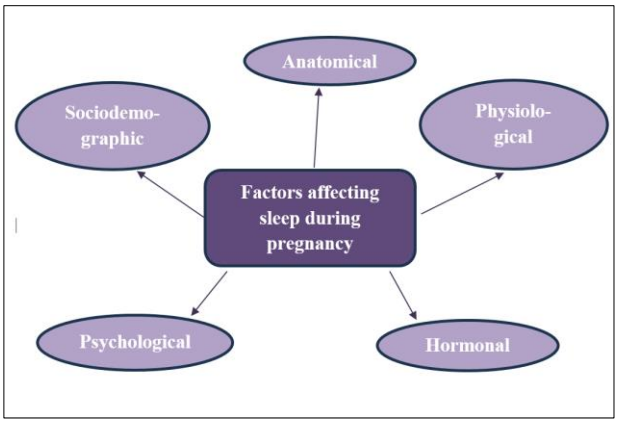

Figure 1: Factors affecting sleep during pregnancy.

Maternal outcome

In 2016, World Health Organization (WHO) antenatal care recommended to include gestational diabetes mellitus, gestational hypertension, pre-eclampsia, and preterm birth, on the list of routine antenatal care. These maternal and foetal health outcomes are caused by sleep disturbances in pregnancy includes insomnia symptoms, poor sleep quality, short or long sleep duration, RLS and OSA on adverse maternal and foetal outcomes both overall and separately.[22]

The changes in physical and mental health, such as pregnancy stress, might interfere with sleep. Many pregnant women may view their lack of sleep as annoying. However, unsound sleep habits, such as sleep apnoea, might worsen pregnancy-related issues. Sleep problems are common during pregnancy which includes insomnia, restless legs syndrome, sleep apnoea, GERD, back pain, quickening and frequent urination especially during the nighttime. The quality of your sleep has an impact on the growing foetus as well.[1] Thus, not only maternal sleep habit but also maternal sleep disorders during pregnancy may be related to early infant sleep patterns and development

Restless leg syndrome (RLS)

RLS can also contribute to insomnia pregnancy. Restless legs syndrome is common in the general population. It is higher in pregnant women with symptoms being worse in the third trimester. Mothers who suffer from restless leg syndrome before pregnancy have symptoms which can worsen during gestation. It is often under-diagnosed due to lack of awareness of clinicians and symptoms can be like leg cramps which is quite common in pregnancy.[8]

Sleep-related leg cramps

Sleep-related leg cramps are a sudden, involuntary painful muscle contraction in the foot or legs that occur during sleep lasting from seconds to minutes. It is usually relieved by flexion of the affected muscle groups. It can be idiopathic or secondary to drugs, peripheral vascular disease, liver cirrhosis, neurological conditions, and metabolic disturbances such as hypokalaemia, hypocalcaemia, or hypomagnesaemia. SRLC is recognised as one of the common mimics of RLS; other recognised mimics are positional discomfort, venous stasis, leg oedema and neuropathies. Regular alcohol consumption of at least once a week can occur up to 30% of pregnancies. The use of magnesium salts and multivitamin supplements are conflicting. Stretching and massaging the muscles during a cramp may help, and regular calf-stretching exercises may help to reduce cramp frequency.

Insomnia in pregnancy

The quality of sleep usually worsens towards the end of the third trimester. The underlying factors contributes excessive daytime sleepiness (EDS) which is snoring, respiratory effort-related arousals, restless legs syndrome, lower back pain and leg cramps which affects sleep efficiency and continuity. Poor sleep quality and short sleep duration are linked to adverse health consequences, including gestational hypertension. These results rely on self-reported insomnia and were not confirmed in a low-risk population with objective sleep measures.[8]

Poor sleep quality

Poor sleep quality is decreased sleep efficiency and deep sleep which occurs frequently towards the end of the third trimester. The earlier the sleep quality is affected during pregnancy increases more risk of complications. Poor sleep quality causes gestational hypertension and gestational diabetes. It can lead to increased systemic inflammation with the occurrence of premature birth and small for gestational age infants. Poor sleep quality can also trigger both prenatal and postpartum depression and anxiety.[8]

Short or long sleep duration

The average sleep duration in pregnant women is lower by 0.5 hours as compared to non-pregnant women. During the first trimester the night sleep time is 8.8 hours, second trimester is 8.3 hours, and it remains constant in the third i.e., 8.4 hours till birth. The changes in sleep duration it refers to either shortening less than 7 hours a night or extending it to more than 9 hours. Sleep deprivation increases the risk of labour duration, gestational diabetes, caesarean section rates, premature birth and small for gestational age infants. Disturbances in sleep duration, both by shortening and lengthening, it influences glucose metabolism and insulin production. [23]

Sleep-disordered breathing (SDB)

It changes in breathing from snoring to complete cessation of breathing (apnoea). Apnoea is the interruption of airflow with a minimum duration of 10 seconds and is accompanied by oxygen desaturation and fragmented sleep. Hypopnea is the interruption of airflow for more than 10 seconds, with more than 50% reduction in airflow and 3% desaturation.[24] The severity of SDB is usually expressed in terms of Apnoea and Hypopnea Index (AHI) depending on the number of events that occur during one hour of sleep. Pregnant women with increased body mass index have a higher AHI than non-increased body mass index pregnant women. SDB may occur secondary to increased diaphragmatic effort leading to suction pressure in the upper airway, ultimately increasing upper airway collapsibility. Also, SDB can result from rhinitis and nasopharyngeal oedema caused by increased oestrogen. So, there is a low permeability of the upper airways and increased resistance to airflow. Snoring in pregnant women usually in the third trimester. [20] SDB leads to sleep fragmentation and thus increased sympathetic activation, with the resistance of the upper airways and the appearance of arterial hypertension. Preeclampsia can result from endothelial dysfunction produced by hypoxia, oxidative damage, or inflammation with secondary cytokine activation. In addition, changes in angiogenesis markers and glycoproteins secreted by the placenta are observed. It favours adult metabolic dysfunctions, especially in males. Snoring is also a factor for small gestational age foetuses and gestational diabetes. Snoring through intermittent hypoxia and sympathetic overload of the placental circulation increases foetal erythropoiesis, with an increase in red blood cells, as well as erythropoietin and interleukin-6 in the vessels of the umbilical cord.[25]

Obstructive sleep apnoea (OSA)

OSA is a disorder that occurs during pregnancy. It has an increased prevalence in pregnant women with higher BMI.[26] Pregnant women with OSA, there is sympathetic stimulation, recurrent hypoxemia, alteration of glucose tolerance and insulin resistance, and chronic systemic and vascular inflammation with negative effects on both the mother and the foetus. Thus, OSA can cause the early onset of gestational hypertension, preeclampsia, gestational diabetes, and premature birth. It also increases the duration of labour, as well as the rate of caesarean sections. [27] Also, increases the risk of premature birth, stillbirth, small for gestational age, or large for gestational age. Due to prolonged labour, hypoxic foetal brain lesions may occur, with lower Apgar scores at birth and neonatal intensive care.

Hypertensive disordered in pregnancy

Sleep deprivation or its fragmentation causes hypertensive disorders, such as pregnancy-induced hypertension or preeclampsia, secondary to intermittent hypoxia, oxidative stress, inflammatory responses, and vascular or neural mechanisms. Vascular damage causes endothelial damage, atherosclerosis, or even thrombosis, with changes in the diameter of small vessels and cardiac output, increasing blood pressure, as well as activation of the hypothalamic-pituitary axis or the renin-angiotensin-aldosterone system.[28] Neuronal mechanisms involve an increase in central sympathetic activity, with a decrease in heart rate and variable blood pressure, by affecting the baroreflex function.

Gestational diabetes mellitus

Sleep-disorders, except insomnia, increase the risk of developing gestational diabetes. It can be explained due to desynchronization secondary to sleep fragmentation or short duration, with endocrine changes such as increased insulin resistance and diabetes due to abnormal sympathetic activation. Along with sleep disorders, the occurrence of gestational diabetes is favoured by the hypothalamic-pituitary axis, endothelial dysfunction, oxidative stress, increased inflammation, and immune dysfunction.[29]

Foetal outcome

Preterm birth

Sleep-disorders such as insomnia and obstructed sleep apnoea are associated with premature birth in 30-40% of cases. Premature birth occurs secondary to inflammation, which is caused by lack of sleep, with increasing inflammatory cytokines such as interleukin-6 (IL-6) and IL-8 which stimulates the production of prostaglandin and thus cause uterine contractions.[30] The risk increases double fold in the third trimester due to short duration and poor sleep quality. Sleep disorders increases the cortisol level, which plays a significant role in the development and maturation of foetal organs.[31] The increased cortisol level can cause a domino effect, with hormone imbalance by lowering progesterone and thus causing birth. In addition, besides sleep disorders, elevated levels of stress in the third trimester of pregnancy lead to increased maternal cortisol.[32]

Small gestational age (SGA)

Foetal growth can also be influenced by sleep disorders. Small for gestational age new-borns (SGA) have a birth weight <10th percentile for gestational age. The increase inflammation is secondary to low sleep duration which determines the decrease of the bioavailable nitric oxide, which ensures maternal-foetal exchanges, growth, and foetal development.[33] As a result of sleep disorders, insulin resistance can occur in pregnant women, influencing foetal weight at birth.[34]

Large for gestational age

Large for gestational age (LGA) foetuses have a birth weight >90th percentile. It is a foetal consequence that

results from sleep disorders, especially in case of insomnia. Additionally, nocturnal hypoxemia is associated with the severity of LGA, especially in case of advanced maternal age or comorbidities such as chronic hypertension, obesity and pregestational diabetes.[35]

The chances of LGA foetus are 5-6 times higher in case of pregnant women with OSA in the third trimester of pregnancy. OSA in pregnancy is associated with increased placental weight and excessive expression of placental leptin, which may cause increased adiposity in the new-born.[36]

Still birth

Foetal death can occur due to maternal hypotension secondary to prolonged maternal sleep, to which a sedentary lifestyle, low body temperature, and low arousal also contribute. In the last month of pregnancy, OSA, sleep duration >9 hours and daytime sleep increase the chances of stillbirth. In addition, the mother's sleeping position in supine position can increase the risk of stillbirth, especially in case of prolonged sleep and lack of awakening.[2]

A descriptive design was conducted in antenatal care unit at El Shiekh Zaied Hospital in Cairo City-Egypt. A purposive sampling technique was used consist of 100 pregnant women and was selected according to the inclusion and exclusion criteria. The tool used foe data collection were structure interview questionnaire and the PSQI. The results of the study reveal that sleep disturbance during pregnancy effects on maternal and foetal outcomes and good maternal behaviour from near half pre-intervention to majority in post intervention. The difference was highly significant statistically (p=0.000).[18]

METHODS

Quantitative studies were included but qualitative and mixed method studies were excluded. This article includes sleeping disturbance during pregnancy which occur usually in the 1st, 2nd and 3rd trimester, and the contributing factors which occur during pregnancy. For this study, I had used Google Scholar, PubMed and CINAHL to conduct a literature review. English-language works were reviewed, and the data base's creation date was 29 April 2023. The phrase "sleep disturbance on maternal and foetal outcomes" was used to search for several literatures. Relevant articles were retrieved. A total of 38 articles were chosen for this review. No actual research has been conducted. The study search was conducted using key words -pregnancy, sleep initiation and maintenance of sleep, sleep apnoea, restless leg syndrome, hormonal impacts, maternal outcome, foetal outcomes, changes in pregnancy and sleep positions.

RESULTS

Majority of sleep issues during pregnancy come and goes away. A comfortable sleeping environment with low ambient lighting at night and picking a suitable bedtime and wake-up time are crucial components of good sleep hygiene. Several factors affect sleep during pregnancy which in turn reflects the adverse outcome on both maternal and foetal. An interesting major component influencing sleep quality and pregnancy outcome is sleep position. Most experts agree that once the abdomen starts to expand, it is best to sleep on the left side with knees bent. Not only is side sleeping more comfortable, but it also helps improve blood flow for the pregnant women and the foetus. Stomach sleeping is also considered safe during early pregnancy, but it eventually becomes impossible, usually sometime during the second trimester.[37] Back sleeping puts pressure on the vena cava and the aorta as the pregnancy proceeds because of the weight of the uterus. Despite of the compression, it may be more challenging for the heart to pump blood to the pregnant woman and the developing baby. Additionally, lying on one's back might strain the spine. Most pregnant women experience lower back pain, which may develop or exacerbate in this position. Snoring is also more likely to occur when someone sleeps on their back. However, there are some strategies that can help alleviate discomfort, increasing the likelihood of a good night's sleep. Positional therapy is the ripe intervention which is advised for the pregnant women. Sleeping in the left lateral position with knees bent forward with pillows supported in between the legs relieves pressure on the inferior vena cava. The sleep position trainer (SPT), a brand-new positional therapy tool, features a sensor that detects sleeping position and gently vibrates while the patient is on their back. Up till the patient changes from supine to another sleeping position, the vibration intensity increases. Limiting the limit of caffeine, intake of too much of fluid and big meal at night will aid in proper sleep cycle. Quality of sleep can be improved by daily physical activity, relaxation for at least 30 minutes each day 4-6 hours before bedtime and a comfortable position of pregnant mothers.

DISCUSSION

Sleep during pregnancy is important for both the pregnant mother and the foetus, but due to factors, such as hormones and body discomfort, during pregnancy, it is not easy to have a healthy sleep. Sleep changes in pregnancy is harmful to both the mother and the foetus. Early identification and treatment are required. Sleep disruption can arise from early pregnancy; hence, sleep should be evaluated throughout antenatal care. The care of pregnant women with sleep disorders should be delivered in a multidisciplinary manner, involving obstetricians, pharmacists, sleep physicians and general practitioners.[10] The growth of the unborn child and the energy needed for labour and delivery depend especially on the amount of sleep that expectant mothers get. Preterm labour and greater levels of pro-inflammatory serum cytokines have all been linked to sleep deprivation during pregnancy, as well as lengthier labours, increased perceptions of pain and discomfort, and higher caesarean rates. A probable link between sleep deprivation, preterm deliveries, and

postpartum depression has also been suggested by limited research. Nevertheless, women fail to ensure themselves sufficient rest, in part since they are oblivious of the negative impact that it may cause on their health. The extent of sleep is still a subject of much research. Pregnancy deprivation and its impact on maternal and foetal outcomes. To better understand how sleep deprivation affects unfavourable maternal and foetal outcomes, as well as to identify the clinical, social, and behavioural risk factors connected to it, further study is required. The early detection of sleep deprivation during pregnancy would help physicians better manage patients' health throughout pregnancy and enable prompt intervention for those patients to prevent negative maternal and foetal outcomes.

Despite the potential adverse effect of sleep deprivation on maternal and foetal outcomes, little research has investigated the prevalence of and risk factors for sleep deprivation during pregnancy and the postpartum period, or the relationship between sleep and pregnancy outcomes. The quality of sleep is often ignored by the physicians as well as the pregnant women themselves as they assume it will improve after delivery. The basic treatment for all sleep disturbance is good sleep hygiene which includes a convenient bedroom temperature, reduced late fluid intake to prevent nocturia, suitable diet in case of gastro-oesophageal reflux, massage in case of muscular pain and use of comfortable mattress and pillows. Additionally, yoga, acupuncture, mindfulness, exercise, relaxation therapy, walking, stretching, use of compression stockings while sleeping or a warm bath before going to bed may also relieve the symptoms theses are safe and effective which can improve the sleep quality of the pregnant women.[38]

CONCLUSION

The study depicted that there are various factors which causes sleep disturbance during pregnancy period such as restless leg cramps syndrome, insomnia pregnancy, gestational hypertension, gestational diabetes which may affect the foetus. Proper care should be initiated regarding the sleep disturbance of the mother or preconceptual counselling must be conducted for these mothers. Mothers also need to be educated regarding the factors affecting sleep disturbance during pregnancy. The remedies which will enhance the quality of sleep can be regular sleeping pattern, positional therapy, daily physical activities, and relaxation for at least 30 minutes each day 4-6 hours before bedtime.

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