Review Article

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Nursing Section

Clinical Care Pathways for Management of Common Complications of Pregnancy: A Narrative Review

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ABSTRACT

India is a vast and diverse country with a complex healthcare scheme that faces significant challenges in providing quality care to its population. Obstetric care is a complex area of healthcare. The history of clinical care pathways in obstetric care reflects a continued effort to improve the quality and safety of healthcare for mothers and infants. This comprehensive review provides an overview of clinical care pathways in obstetric care. It sheds light on the current evidence supporting the use of clinical care pathways for the management of anaemia during pregnancy, Gestational Diabetes Mellitus (GDM), pre-eclampsia, and Preterm Labour (PTL). The primary aim of this review is to recognise the accessibility and strength of evidence for the use of clinical care pathways in the management of common complications of pregnancy.

Keywords: Anaemia gestational diabetes mellitus, Pre-eclampsia, Preterm labour

INTRODUCTION

Obstetric care is a complex area of healthcare in developing a care pathway for child-birth. Care pathways are evolving as effective tools to enhance clinical and organisational performance. The use of clinical care pathways has been studied to assess their effectiveness in improving patient outcomes and reducing healthcare costs [1]. Definitions drawn from literature in the early to mid-1990s generally agree that the care map is presented as a graph or schedule of care activities described on a timeline and accomplished as part of the patient's treatment by a multi-disciplinary team to achieve identified outcomes [2].

Clinical care pathways administered by the healthcare professionals and family members in providing care to support families by assisting them with the coordination of care in any domain of life, may find care mapping beneficial. This can involve nurses or nurse practitioners, social workers, community health workers, teachers, supporters, medical assistants, physicians, family navigators, family support workers, or peer support workers [3].

A clinical pathway is a multi-disciplinary management tool based on evidence-based practice for a specific group of patients with an anticipated clinical course, where the different roles of the professionals involved in patient care are defined, refined, and sequenced, whether by the hour, day (in acute care), or visit (in home care). Outcomes are directly tied to specific interventions. Clinical care maps can reduce patients' hospital stays, increase overall efficiency, and improve service quality of healthcare professionals [4].

A study published in past literature showed that over the first two years of implementation, the utilisation rates were 70% and 73% for fiscal year 19 and fiscal year 20, respectively. When comparing costs between individuals who used the pathways and those who did not, a reduction in drug costs was observed with the implementation of pathways. This decrease was more pronounced when clinicians adhered to the pathway recommendations. Specifically, per-person per-month drug costs were reduced by 8% in year one (fiscal year nineteen) and by 4% in year two (fiscal year twenty) when pathways were utilised [5].

Earlier research has demonstrated the efficacy of clinical pathways as an instrument in various clinical settings, including emergencies, surgeries, and typical clinical cases. It encompasses the entire process from diagnosis to clinical audit and is managed by health professionals as they provide care. It is imperative that healthcare workers collaborate vigorously when implementing a clinical care pathway. Healthcare professionals must emphasise on the development and outcome of care and eliminate un-necessary or in-effective treatments [6].

Local variations, poor service integration, and gaps in referral systems further hinder the continuity of quality care. The absence of proper equipment (digital weighing scales and infant meters) and the varying skill levels of community health workers are examples of practical limitations. Additionally, there is still a lack of information and initiatives in India regarding the best methods to prevent, identify, and treat severe malnutrition in infants younger than six months of age. State-specific experiences from Maharashtra, Bihar, and West Bengal regarding the adaptation of the MAMI Care Pathway Package to the Indian setting were shared [7].

Another study published in the Journal of Cureus found that the implementation of evidence-based strategies for managing post-partum has improved the quality of care and reduced the need for blood transfusions [8].

History of Clinical Care Pathways in Obstetric Care

In the 1990s, the focus shifted towards the development of clinical care pathways, which are more detailed and specific than guidelines, and outlines the optimal sequence and timing of interventions in a particular clinical situation. The use of clinical care pathways in obstetric care has been shown to improve patient outcomes, reduce healthcare resource utilisation, and increase adherence to evidence-based practices [5].

There is significant variation in the components of clinical care pathways, and their implementation requires coordination and collabouration among multi-disciplinary teams. Additionally, the ongoing evaluation and refinement of clinical care pathways are necessary to ensure their effectiveness and sustainability. The history of clinical care pathways in obstetric care reflects a continued effort to improve the quality and safety of healthcare for mothers and infants [6].

Scope of Clinical Care Pathways in Obstetrics Care

According to the supported care pathway in Irish maternity services, the clinical care services that were to be provided by

a team of midwives were replaced between the community and hospital, thereby supporting women through all stages of their care continuum. The supported clinical care pathways will be available to women based on their risk profile, enabling women to see the most appropriate professional based on their clinical needs. The clinical care pathway was broken down into three main components: antenatal, intrapartum, and postnatal care periods [9].

Inter-professional collabouration is the service provided by a team of different healthcare professionals and is essential to ensure effective clinical treatment. The healthcare team engages in inter-relation and interaction throughout the input, process, and output of patient care. Members actively collaborate in implementing comprehensive nursing care. The procedure involves multi-disciplinary interventions with a focus on predetermined outcomes [6].

Common Complications of Pregnancy

Pregnancy is a complex physiological process that can be associated with various complications. Early discovery and management of these complications are crucial for the health of the mother and fetus. Some of the most common complications of pregnancy are:

Gestational Diabetes Mellitus (GDM): GDM is a type of diabetes that develops during pregnancy. It can cause high blood sugar levels, which can lead to various complications such as macrosomia, preterm birth, and preeclampsia [10].

Hypertension: It is the most common medical problem faced during pregnancy, complicating 2-3% of pregnancies. The employed group on high blood pressure in pregnancy of the national high blood pressure education program recommends classifying hypertensive diseases during pregnancy into four categories: chronic hypertension, pre-eclampsia-eclampsia, pre-eclampsia on top of chronic hypertension, and gestational hypertension. These four conditions need to be addressed (transient hypertension of pregnancy or chronic hypertension identified in the latter half of pregnancy) [11].

Preterm Labour (PTL): PTL is defined as labour that begins before 37 weeks of gestation. It can lead to premature birth and associated complications such as respiratory distress syndrome, intraventricular haemorrhage, and necrotising enterocolitis [12].

Placenta previa: Placenta previa is a disorder where the placenta covers the cervix, leading to vaginal bleeding. It can cause maternal haemorrhage and lead to preterm birth [13].

Anaemia: Anaemia is a condition characterised by low levels of Haemoglobin (Hb) in the blood. It is a common complication of pregnancy and can lead to preterm birth, low birth weight, and maternal mortality [14].

Evidence of Clinical Care Pathways in Management of Anaemia during Pregnancy

Anaemia is commonly described as a Hb value less than two Standard Deviations (SD) below the median value for a healthy matched population by age, sex, altitude, smoking status, and pregnancy status. When oxygen-carrying capability or quantity of red blood cells' is inadequate to meet physiological demands, the condition is known as anaemia. Pregnancy-related anaemia is difficult to define due to factors such as natural plasma expansion, ethnic variation in Hb levels, and the widespread use of iron supplements. According to the Centers for Disease Control, anaemia during pregnancy is defined as Hb levels less than 11 g/dL {haematocrit; (Hct) <33%} during the first and third trimesters and less than 10.5 g/dL (Hct <32%) during the second trimester (CDC).

Anaemia is one of the most common pregnancy disorders that can harm the foetus as well as the mother. Clinical care pathways can help standardise the diagnosis, treatment and aftercare of anaemia during pregnancy. The World Health Organisation (WHO) recommends testing all expecting mothers for anaemia and providing appropriate treatment during their first prenatal care visit. The WHO also recommends using clinical care pathways to ensure the best possible management of anaemia during pregnancy [14]. The American College of Obstetricians and Gynecologists (ACOG) recommends routine screening for anaemia at the first prenatal visit of gestation and a proper clinical care pathway for the diagnosis and management of anaemia during pregnancy [15].

Preventing anaemia during pregnancy requires not only food fortification but also education of women to increase their iron intake and foods that favor the absorption of this mineral, as well as limit their consumption of foods that inhibit iron absorption. The integration of nursing practice in both obstetrics and collective health should be part of this orientation [16].

Evidence of Clinical Care Pathways in Management of Gestational Diabetes Mellitus (GDM)

GDM is a common pregnancy complication characterised by elevated blood sugar levels during pregnancy. According to the International Diabetes Federation, the prevalence of GDM ranges from 5% to 25.5%. The prevalence is dependent on race, ethnicity, age, body composition, and diagnostic criteria. GDM can lead to adverse maternal and foetal outcomes, such as pre-eclampsia, macrosomia, neonatal hypoglycaemia, and an increased risk of developing Type 2 Diabetes Mellitus (T2DM) later in life [17].

The management of GDM aims to achieve optimal glycaemic control while minimising maternal and foetal complications. The American Diabetes Association (ADA) recommends the use of clinical care pathways or algorithms to guide the care of women with GDM. Clinical care pathways outline the sequence and timing of interventions and the roles and responsibilities of healthcare professionals involved in the care of the patient [18].

Key components of clinical care pathways for GDM:

Screening and diagnosis: Evidence consistently demonstrates that complications in pregnancies complicated by diabetes are associated with the level of hyperglycaemia in a continuous way. There is also good evidence to support early diagnosis and treatment of GDM in order to reduce the risk for the mother and baby. The first step in the management of GDM is early identification through universal screening with a 75-gram Oral Glucose Tolerance Test (OGTT) between 24 and 28 weeks of gestation. Women at high risk of GDM, such as those with a history of GDM, polycystic ovary syndrome, obesity, or a family history of diabetes, should be screened earlier in pregnancy. The diagnosis of GDM is made based on the OGTT results, with threshold values of ≥92 mg/dL for fasting plasma glucose, ≥180 mg/dL for 1-hour plasma glucose, and ≥153 mg/dL for 2-hour plasma glucose [19].

Medical Nutrition Therapy (MNT): Medical Nutrition Therapy (MNT) is a cornerstone of GDM management and involves individualised meal planning and monitoring of carbohydrate intake to achieve glycaemic control. The ADA no longer recommends specific amounts for carbohydrate, fat, or protein intake, but they do suggest that people get their carbs from vegetables, whole grains, fruits, and legumes. It is advised to avoid carbs high in fat, sodium, and sugar. Women with GDM should also be advised to eat frequent, small meals, and avoid sugary drinks and foods with a high glycaemic index [20].

Physical activity: Regular physical activity is recommended for all pregnant women, including those with GDM. The ADA recommends at least 150 minutes per week of moderate-intensity exercise, such as brisk walking, swimming, or cycling. Physical activity can improve insulin sensitivity, glucose uptake, and cardiovascular health, and can reduce the risk of developing GDM-related complications [21].

Pharmacologic therapy: If MNT and physical activity fail to achieve glycaemic control, pharmacologic therapy with insulin or oral hypoglycaemic agents may be necessary. Insulin is the preferred

agent for GDM management, as it does not cross the placenta and has a long track record of safety and efficacy [22].

Foetal surveillance: Women with GDM are at increased risk of foetal overgrowth, which can lead to complications such as macrosomia, shoulder dystocia and birth trauma. Foetal surveillance, including ultrasound for foetal growth assessment and non-stress tests for foetal well-being, should be performed at regular intervals to detect and manage these complications [23].

Evidence of Clinical Care Pathways in Management of Pregnancy Induced Hypertension

Pregnancy-induced hypertension is a major contributor to maternal and perinatal morbidity and mortality. In the United States, about 15% of maternal deaths are attributable to hypertension, making it the second leading cause of maternal mortality. The mother's risk of cardiac failure, heart attack, renal failure, and cerebrovascular accidents is increased by severe hypertension. Additionally, the foetus is at risk of problems such as inadequate oxygen transport from the placenta, growth restriction, premature birth, placental abruption, foetal death, and neonatal death. The management of PIH aims to control blood pressure, prevent complications, and optimise maternal and foetal outcomes. Clinical care pathways or algorithms can help standardise care and improve outcomes for women with PIH [24].

Key Components of Clinical Care Pathways for PIH

Diagnosis: The first step in the management of PIH is to diagnose the condition. This involves measuring blood pressure and checking for proteinuria. Blood pressure should be measured at each prenatal visit, and any significant increase in blood pressure should be evaluated promptly. Pre-eclampsia is defined as the presence of Systolic Blood Pressure (SBP) greater than or equal to 140 mm Hg or a Diastolic Blood Pressure (DBP) greater than or equal to 90 mm Hg, on two occasions at least four hours apart in a previously normotensive patient. In addition to the blood pressure criteria, proteinuria of greater than or equal to 0.3 grams in a 24-hour urine specimen is indicative of pre-eclampsia. Severe proteinuria is defined as five grams or more of protein in a 24-hour urine collection or a 3+ or greater result on urine dipstick testing of two random urine samples collected at least four hours apart [25].

Antenatal care: Women with PIH require close monitoring throughout pregnancy. This includes regular prenatal visits to monitor blood pressure, urine protein, and foetal growth. The frequency of prenatal visits may increase as the pregnancy progresses, depending on the severity of the condition [26].

Blood pressure control: The goal of blood pressure management in PIH is to reduce the risk of complications while avoiding undue harm to the mother or foetus. Non-pharmacological interventions such as rest, reduction of salt intake, and increased fluid intake may be recommended for women with mild PIH. Antihypertensive medication may be required for women with severe PIH, to lower blood pressure to safe levels [27].

Foetal surveillance: Women with PIH are at increased risk of foetal growth restriction and other complications. Foetal surveillance, including ultrasound for foetal growth assessment and Doppler assessment of umbilical artery blood flow, should be performed at regular intervals to detect and manage these complications [28].

Delivery: The timing and mode of delivery depend on the severity of PIH, gestational age, and foetal well-being. Women with severe PIH may require delivery before term, while those with mild to moderate PIH may be managed expectantly until term. Vaginal delivery is usually preferred, but Caesarean delivery may be necessary in some cases [29].

There is limited evidence on the effectiveness of clinical care pathways in the management of PIH. However, some studies have shown that the use of standardised protocols or algorithms can improve adherence to evidence-based guidelines and reduce the incidence of complications. Therefore, clinical care pathways may be a useful tool in the management of PIH [29,30].

Evidence of Clinical Care Pathways in Management of Pre-term Labour

PTL is defined as the onset of regular uterine contractions accompanied by cervical change before 37 weeks of gestation [31].

Preterm birth is currently the leading issue of neonatal morbidity and mortality in developed countries. The incidence is increasing. In 2010, 11.1% of all live births were delivered preterm, with 14.9 million premature deliveries worldwide. The rate of preterm birth varies widely between countries ranging from 5 to 9% of births in Europe, 12% in the USA, and upto 18% in Malawi. Defined as delivery before 37 weeks gestation, preterm birth can be divided into three categories: spontaneous PTL with intact progress intact membranes (50%); preterm premature rupture of membranes (30%); and iatrogenic preterm delivery for maternal in which labour is either induced or delivery is by prelabour caesarean (20%). The first two categories are often collectively referred to as spontaneous preterm birth and their aetiology may be very similar [32]. A recent worldwide systematic analysis of preterm birth rates in 2010 concluded that there was no decrease in rates of preterm birth in countries studied from 1990 to 2010, with rates either being increased or stable [33].

In a study done in December 2010, a total of 215 women who had undergone one cesarean section in total were observed along a typical care pathway. There was a median parity of 1.0. The remaining demographic characteristics were similar. Only 44.6% of mothers who qualified chose to undergo a scar test. After a Caesarean section, the vaginal delivery achievement rate was 49.4%, and the longest active phase of labour (31.8%) was the most frequent cause of failure. Following a caesarean section, maternal morbidity was similar in the groups of vaginal births that succeeded and those who failed. After a caesarean section, the incidence of bleeding was 2.3% and 4.4% for the successful and unsuccessful vaginal birth groups, respectively. After a Caesarean section, the percentage of infants with acidotic arterial pH (<7.10) was 3.1% in the successful group and 22.2% in the unsuccessful group. Perinatal death was not reported. Overall, the evidence suggests that clinical care pathways can be effective in reducing the rate of preterm birth and increasing the use of antenatal corticosteroids for women with PTL. However, more research is needed to determine the impact of clinical care pathways on neonatal outcomes and maternal morbidity [34].

Limitation(s) of Clinical Care Pathways in Obstetrics Care

Some of the limitations of clinical care pathways in obstetric care are:

Staff involvement- To ensure that the goals are met at each phase, from pathway adoption to implementation and maintenance, all pertinent workers must be involved [33].

Lack of awareness- This relates to the knowledge, attitudes, and practices of clinicians. Clinicians' attitudes towards clinical pathways to standardise healthcare may be disputed or hostile [33].

Type of provider- Clinical pathway providers should be involved in the care process towards achieving successful implementation of care pathways [33].

Use of language- In clinical pathways, multiple languages is used, such as in the form of diagrams, text documents, and tables. This makes it easy for service providers to understand patient care [33].

Complexities of labour and delivery- Labour and delivery is a complex and unpredictable process, and clinical care pathways

may not account for all possible variations in labour progression or foetal well-being [35,36].

Resistance to change- Clinical care pathways may represent a significant change in clinical practice, which may be met with resistance from healthcare providers who are accustomed to their traditional practices [36,37].

Difficulty in measuring outcomes- It may be difficult to attribute improvements in patient outcomes solely to the use of clinical care pathways, as other factors may also contribute to improvements [37,38].

Resource limitations- Clinical care pathways may require additional resources, such as staff time or equipment, which may not be available in all healthcare settings [39].

Standardisation- Clinical care pathways are designed to provide a standardised approach to care. However, the standardisation can sometimes lead to inflexibility in the approach, which can be challenging when dealing with complex cases that may require individualised care plans [39,40].

Implementation- Implementing clinical care pathways in obstetric care can be challenging due to the need for multi-disciplinary collaboration, the availability of resources, and the potential for resistance to change among healthcare providers [41].

Adherence- Adherence to clinical care pathways can be difficult to achieve, particularly when there are competing priorities, time pressures, and patient-specific factors that need to be taken into account [42].

Evaluation- Clinical care pathways need to be evaluated regularly to ensure that they are effective, efficient, and patient-centered. However, the evaluation process can be time-consuming and resource-intensive [41,42].

Clinical care pathways can provide a useful framework for standardising care and improving patient outcomes. Healthcare providers must carefully evaluate the applicability of clinical care pathways to their patient populations, and ongoing evaluation and refinement of the pathways may be necessary to ensure their effectiveness and sustainability [40,43].

CONCLUSION(S)

In conclusion, the use of clinical care pathways in the management of common complications of pregnancy has been shown to improve the quality of care and patient outcomes. These pathways provide a standardised approach to the diagnosis, treatment, and follow-up of these conditions, reducing the variability of care and ensuring that patients receive the most appropriate interventions. The evidence suggests that the implementation of clinical care pathways can lead to improved maternal and foetal outcomes, including a reduction in the incidence of preterm birth, neonatal morbidity, and maternal complications. However, further research is needed to determine the optimal design and implementation of clinical care pathways for these conditions, including the use of digital technologies and the integration of patient preferences and values. The implementation of clinical care pathways represents a promising strategy for improving the quality of care and outcomes for women with common complications of pregnancy.

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