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Risk Factors Associated with Preterm Birth in the Gaza Strip

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Abstract

Preterm birth remains one of the main causes of peri-natal mortality and morbidity that exerts significant strain on public health resources. The over aim of this study was to assess the main risk factors either maternal or fetal that contribute to preterm birth in the Gaza Strip, which in turn would help in developing a base line data that can help in developing a preventive program aiming towards reducing the rate of preterm birth and its negative consequences.

A hospital based case control study was carried out at two large governmental hospitals namely El-Shifa and Khan-Younis Hospitals that are equipped with neonatal intensive care units. Two hundred cases and 200 controls and their birth outcomes were included in the study with matching the site of delivery and the address. Data was collected through direct methods that included biomedical information and indirect methods through a structured interviewed questionnaire with a response rate of 94%.

Factors that were considered as significantly risky for preterm birth in the Gaza-Strip included, maternal age of more than 35years, previous history of preterm birth, positive family history of preterm birth. Additionally, significant risk factors included; the presence of congenital gynecological abnormalities, previous history of C.S delivery, inadequate antenatal care and failure to gain adequate weight during pregnancy. Moreover, maternal history of premature rupture of membrane, presence of placental abnormality, presence of diseases associated with and/or caused by pregnancy, presence of an indication for pregnancy termination and the exposure to different kinds of stressors were significant risk factors as well.

The study contributes in highlighting the general picture of preterm birth risk factors and provides hints for possible intervention strategies that could contribute in reducing the incidence of preterm birth in the Gaza Strip. More research is needed to study risk factors in a more focused way.

ملخص الدراسة

تعتبر الولادات المبكرة (التي تحدث قبل أن يتم الجنين الأسبوع السابع والثلاثين من أسابيع الحمل) من أهم العوامل التي تؤدي إلى حدوث الوفيات والأمراض المتعلقة بالسنة الأولى من العمر. هدفت هذه الدراسة إلى تقويم عوامل الخطر سواء لدى السيدة الحامل أو لدى الجنين التي قد تزيد من احتمالية حدوث الولادة المبكرة والتي بدورها قد تساهم في إعداد برامج وقائية لمنع الإصابة بهذه الأمراض.

الأهداف الخاصة:-

- تقويم الوضع العام للولادات المبكرة في قطاع غزة.
- معرفة أهم عوامل الاختطار التي تؤدي إلى حدوث الولادات المبكرة سواء لدى السيدة الحامل أو لدى الجنين.
- فحص العلاقة بين السمات الجسدية لدى السيدة الحامل وعلاقتها بحدوث الولادة المبكرة.
- فحص العلاقة بين الظروف الاجتماعية والاقتصادية وبين حدوث الولادة المبكرة.
- استخلاص التوصيات المناسبة التي قد تؤدي إلى تقليل نسبة حدوث الولادات المبكرة.

منهجية الدراسة:-

هذه الدراسة هي دراسة تحليلية مقطعية مقارنة درست الحالات المرضية مع وجود عينة (مجموعة) ضابطة

عينة الدراسة:-

تكونت العينة من مائتي سيدة وضعت قبل أن يتمن الأسبوع السابع والثلاثون من الحمل في كل من مستشفى دار الشفاء وخان يونس (قسمي الولادة والعناية المركز للأطفال حديثي الولادة) ومائتي سيدة وضعت خلال ٣٧ - ٤٢ أسبوع حمل في الفترة الزمنية ما بين مارس ٢٠٠٢ وحتى منتصف إبريل ٢٠٠٢ واشتملت العينة على حالات من مختلف مناطق قطاع غزة .

كيفية جمع المعلومات:-

تم جمع المعلومات بطريقتين مباشرة وغير مباشرة حيث تم تصميم استبيان من إعداد الباحثة لجمع المعلومات الشخصية والطبية والاجتماعية.

أما الطريقة المباشرة فاشتملت على قياس الوزن والطول للسيدة الحامل وكذلك المولود/اليد وقد تم فحص صدق وثبات الأداة البحثية من الناحية العلمية والعملية من قبل محكمين بالإضافة لتطبيق الاستبانة على عينة استطلاعية قبل البدء في البحث.

النتائج:-

- في هذه الدراسة تم التعرف على العديد من عوامل الاختطار لدى السيدة الحامل والجنين والتي يعتقد بأن يكون لها الأثر المباشر في حدوث الولادة المبكرة.
- أظهرت الدراسة أن عمر السيدة الحامل ٣٥ فما فوق له علاقة مباشرة بحدوث الولادة المبكرة حيث علاقة الارتباط عالية وذو دلالة إحصائية.
- كما أظهرت الدراسة أن بعض السمات الجسدية للسيدة الحامل ذو علاقة إيجابية وذات دلالة إحصائية عالية مع حدوث الولادة المبكرة.
- أظهرت الدراسة أن الأمراض الناتجة مباشرة عن الحمل قد تؤدي إلى حدوث الولادة المبكرة.

- كما أظهرت النتائج وجود علاقة إيجابية بين دواعي إنهاء الحمل مثل ارتفاع ضغط الدم وحدوث الولادة المبكرة.
- كذلك أظهرت الدراسة وجود ارتباط بين المشاكل التي تتعلق بالمشيمة وانفجار كيس المياه المحيطة بالجنين وحدوث الولادة المبكرة.
- كما وأظهرت الدراسة أن الأطفال المبتسرين يحتاجون لدخول العناية المركزة للأطفال حديثي الولادة بنسبة تفوق كثيراً الأطفال مكتملي فترة الحمل.

التوصيات:-

من أهم التوصيات التي خرجت بها الدراسة:-

- أن يضع صناع السياسة الصحية سياسات واستراتيجيات تهدف إلى تحسين الوضع السكني للعائلات و تعزيز تنظيم الأسرة وتبني سياسات تهدف إلى كيفية التعامل مع الضغوط النفسية المحيطة.
- العمل على تبني نظام تقويم لعوامل الخطر التي تؤدي إلى الولادة المبكرة يكون مراعيًا للظروف المحيطة.
- توحيد استخدام البرتوكولات المتعلقة برعاية السيدة الحامل (قبل الحمل - أثناء الولادة - بعد الولادة).
- توحيد استخدام بروتوكول التعامل مع حالات الولادة المبكرة.
- تعزيز التثقيف الصحي لدى الجمهور سواء بواسطة النشرات و حملات التوعية و الإعلام المرئي والمسموع والمكتوب.

توصيات بحثية:-

- تقترح الدراسة إرجاء دراسات أخرى من أجل توثيق نتائج هذه الدراسة تعالج المتغيرات المؤثرة بشكل أكثر تركيزاً.
- إجراء دراسات أخرى تهدف إلى دراسة العلاقة بين فقر الدم والولادة المبكرة.

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Chapter I

Introduction

Preterm birth continues to be the leading cause of perinatal and postnatal mortality and morbidity especially in developing countries where health facilities are not only limited but also not properly functioning (Arafa et al, 1998). In spite of the knowledge of their prevention globally, preterm births are arguably one of the most important causes of maternal and child health problems in developed societies (Kramer et al, 1998). According to Copper et al (1993), preterm birth occurs in 7% to 11% of pregnancies but is responsible for 85% of neonatal deaths in normally formed infants who did not have any congenital malformations (Copper et al, 1993). Whilst a normal pregnancy lasts nine months, or about 38 to 42 weeks of gestation, newborns are considered to be premature if they are born before the completion of 37 weeks of gestation (Witter and Keith, 1993). Moreover, almost all infants who are born premature are considered low birth weight with a birth weight of less than 2500grams (Johnston, 1994).

According to Aerts et al (1999), risk factors of preterm can be classified as non-recurrent, recurrent and treatable, and recurrent and not treatable. Non-recurrent factors include placental abnormalities (previa, abruption), history of second trimester vaginal bleeding and fetal anomalies. Recurrent and treatable risk factors include genitourinary tract infection, low socioeconomic status, inadequate utilization of prenatal care, congenital malformations (cervix and uterus), poor nutritional status as indicated by **total** increased in weight during pregnancy, low pre-pregnancy weight, tobacco use and **anemia**. Recurrent and not treatable factors include race and history of preterm birth (Aerts et al, 1999).

Therefore, **this** classification of risk factors for preterm birth has led the researcher to include these **risk factors** in her design of this study.

Preterm births have immediate and long-term sequelae that result mainly from the biologic immaturity at birth. Immediate sequelae include respiratory distress, intraventricular hemorrhage, necrotizing enterocolitis, hypothermia, and jaundice. Long-term sequelae include cerebral palsy, mental retardation, blindness, deafness, developmental delay, arteriosclerosis, hypertension and pulmonary diseases during adulthood (Berkowitz et al, 1993).

Until recently, 28 weeks of gestation was considered the age below which, the infant is not possibly viable outside the uterus. With the advanced technology, using the range of neonatal intensive care unit (NICU) services, and surfactant therapy, the age of viability decreased to give a considerable hope to those infants born before 25 weeks. Even some babies at 23-24 weeks can now be enabled to survive (Johnston, 1994). Weismiller (1999) reported that even after four decades of research, the rate of preterm birth has not changed and some data indicate that the rate might be worsening (Weismiller, 1999). The rate of preterm birth has increased mainly due to the change in the frequency and the gestational age of multiple-gestation pregnancies, increase in obstetric interventions, greater registration of extremely early gestational births (20-27 weeks) and increases in the use of ultrasound-based estimates of gestational age (Kramer et al, 1998). At the other end of the spectrum, the rate of preterm birth can be reduced by early and accurate diagnosis of preterm labor, proper management, and with the provision of neonatal care (Von Der Pool, 1998).

As in other countries, preterm births contribute to increase in infant mortality rate in Palestine (MOH, 2002) and thus increase the burden on the Palestinian health care system. The literature indicates that, the direct costs of prematurity are immense. Management of preterm labor and preterm birth accounts for health care expenditure in the United States of America of over \$3 billion per year (Weismiller, 1999). To

overcome this problem preventive programs have been conducted in different countries all over the world aiming at reducing the rate of preterm birth. These factors have influenced the researcher to study such perceived important problem as explicitly mentioned in the subsequent paragraphs.

Justification and Significance of the study

As inferred from the literature, preterm birth remains one of the main causes of perinatal mortality and morbidity. Despite its importance, the etiology of preterm birth and the key to its prevention remains poorly understood. According to the Center of Disease Control and Prevention (CDC), babies who are born preterm are at higher risk of illness, disability and death compared to infants born at full term (CDC, 2000). About 20% to 25 % of preterm deliveries are induced because of maternal and fetal causes that are considered inevitable and unavoidable while the remaining preterm births occur spontaneously and attention should focus toward the identification of women who are at higher risk for preterm delivery (Carroll et al, 1996). Preterm birth is arguably the most important maternal and child health problem in developed societies leading to infant mortality and is associated with major long-term neurocognitive, respiratory and ophthalmologic morbidity. Although risk factors for preterm birth have been commonly studied worldwide, neither well-formed studies nor systematic surveys have been conducted to evaluate either risk factors of preterm birth in the Gaza Strip or the short and long-term sequela of prematurity. Furthermore, there is no systematic adequate and accurate information about preterm birth at the Gaza Strip Hospitals. Greater efforts are required to improve the understanding of the risk factors of preterm birth in the Gaza Strip. Moreover, the provision of intensive care for extremely preterm newborns is expensive and giving that considered as traumatic event (Kramer et al, 1998). With the immense cost of preterm birth, high

total fertility rate in Gaza Strip, bad economic status, lack of resources and the highly perceived stressful life in Gaza Strip there is an important necessity to study the risk factors of preterm birth in the Gaza Strip. Taking into consideration the uniqueness of the population and the social orientation of previously mentioned factors on preterm birth, this study was carried out to determine the main risk factors that contributes to preterm birth in Gaza Strip either maternal or fetal factors, which will lead to the suggestion of strategies to prevent preterm birth that should be etiologically based and country specific.

Purpose of the study

The purpose of this study is to determine the main risk factors either maternal or fetal factors, that contribute to preterm birth in the Gaza Strip, which in turn would help in developing a base line data that can help in developing a preventive program aiming towards reducing the rate of preterm birth and its consequences. The study could help in decreasing the infant mortality and morbidity in relation to preterm birth in the Gaza Strip.

Objectives

- 1-To assess preterm birth status in the Gaza Strip.
- 2-To identify maternal physical characteristics that contribute to preterm birth.
- 3-To assess the impact of socioeconomic status on preterm birth.
- 4-To identify obstetric and fetal related problems that contribute to preterm birth.
- 5-To evaluate the consequences of preterm birth on the health status of the preterm infants.
- 6-To suggest recommendations and reparative strategies that positively have impact on reducing preterm birth in the Gaza Strip.

Chapter VI

Conclusion and Recommendations

Conclusion

In an attempt to identify the most common risk factors either maternal or fetal for preterm birth in the Gaza Strip, the current case control study was conducted at the two tertiary hospitals in the Gaza Strip; El Shifa and Khan-Younis hospitals, and included 200 cases and 200 controls and their pregnancy outcomes. These two NICU equipped hospitals, could roughly deal with the majority of preterm births in the Gaza Strip. Through understanding preterm risk factors, the study seeks to suggest developing preventive strategies towards reducing the rate of preterm.

The findings of the study illustrate that a number of risk factors are associated with the development of preterm birth. Among the studied maternal factors, maternal age, socioeconomic status, physical characteristics, obstetric history, presences of diseases associated with and/or caused by pregnancy, presences of an indication for pregnancy termination and lastly the exposure to different kinds of stressors were implicated by the development preterm birth in the Gaza Strip. Fetal implicated factors for preterm birth included twin, congenital malformations and intrauterine growth retardations.

Maternal age of being 35 years and more is associated with preterm birth. Past obstetric and family history plays an important role as a contributing factor for preterm birth; such as previous maternal and family history of preterm birth, short interval (less than 18 month) between the last two pregnancies, history of previous CS delivery, history of stillbirth and the presence of congenital gynecological problems.

Additionally, the study indicates that other factors that are related to the concerned (current) pregnancy, such as the mode of conception; other than spontaneous conception and paying less than 4 antenatal visits are contributing factors to the preterm birth.

The study indicates that the presence of diseases caused by pregnancy, such as PIH is a contributing factor for preterm birth. Additionally, the presence of diseases associated with pregnancy is regarded as a risky factor for preterm particularly the positive history of vaginal infection. Additionally, maternal history of vaginal bleeding is considered as a risk factor for preterm birth, especially the positive history of second trimester vaginal bleeding. The presence of an indication for pregnancy termination is considered as a risk factor for preterm birth; particularly, the positive history of pregnancy termination due to PIH.

The study clarifies that there is an inverse relationship between anemia during pregnancy and preterm birth. Additional studies are required for further assessment. Maternal exposure to different kinds of social, political, psychological stressors are contributing to the development of preterm birth. Moreover, the only fetal risk factor that is associated with preterm birth is related to twin pregnancy.

Preterm birth negatively affects the health status of the premature infants as they tend to have lower birth weight and lesser length comparing with the full term infants. The study revealed that, high percentage of preterm infants is admitted to NICU if compared with the controls group, mainly due to the respiratory distress syndrome, intrauterine growth retardation and congenital malformations. This reflect the magnitude of health problems that face by preterm infants.

To summarize, bad economic status, high fertility rate, unstable political conditions, lack of awareness among the pregnant women regarding the proper nutrition during pregnancy are inferred preterm birth risk factors that predispose women for preterm

in the Gaza-Strip. Therefore, it is necessary to conduct an appropriate preventive program that aims to reduce the incidence of preterm birth in the Gaza Strip.

This study enabled the researcher to be in a position in which he can provide the coming recommendations.

Recommendations

General recommendations

These measures could be achieved through the mutual cooperation among the different sectors including the governmental organizations, NGOs, community and families.

Improving housing conditions

Supporting family planning services

Adopting health promotion as a general strategy for all age groups particularly women and children.

Taking adequate measures aiming to improve the nutritional status of pregnant women.

There is a need to develop community-based stress coping mechanism programs.

Encouraging family support especially to pregnant women.

Recommendations for decision makers and management in order to standardize

Preterm care

Agreeing on a definition for preterm birth with a precise cut off point distinguishing between abortion and preterm delivery.

Revising/Utilizing the recently developed protocols for antenatal, natal and postnatal care. This could add in early diagnosis of possible risk factors. Health

professionals need to be trained on these protocols and to be familiar with the consequences of issues such as preterm birth.

- Adopting a risk scoring system taking into account the uniqueness of the Palestinian culture. The findings of this study indicate risk factors that are relevant to the Palestinian situation. According to the available risk factor, measures would be taken.
- Measures for follow up and monitoring of preterm birth need to be strengthened. Data base information in this regard is very essential.
- Encouraging women's attendance to health centers and considering factors that increase their utilization of services such as satisfaction studies, incentives, outreach programs and so on.
- Policy makers need to take decision focusing on the holistic concept of the maternity care. Care should not only focus on the medical aspect rather it should incorporate other aspects of care such as psychological care. Health personnel need to consider the social dimension of health and they are required to provide holistic care meanwhile considering the uniqueness of their clients.
- The Palestinian health care system needs to evaluate the offered antenatal care services and to identify gaps in the services. Given the importance of antenatal care, measures need to be taken increase its effectiveness and utilization.

Recommendations relevant to health promotion and health messages

Given that many of the risk factors identified in the study could be resolved or at least be reduced through health education, measure should be taken in this regard using different channels; such as counseling, radio, TV, educational materials and health education sessions and so on. Health education in this regard could include but be restricted to:

- Health messages about stress release
- Health messages about coping with stress
- Mass media campaign about signs of premature labor
- Health messages about antenatal care and its importance, utilization, available health facilities
- Dangerous signs of pregnancy
- Nutrition and weight gain

Research recommendations

- Further studies should be conducted with larger sample size to verify the findings of this study.
- More focused studies that tackle certain group of variables independently need to be conducted such as demographic variables, familial tendency for preterm birth.
- Further studies are needed to study independently the relationship between anemia and preterm birth.
- More well designed and controlled studies are needed for variables that have been studied subjectively in this study: such as vaginal infection and urinary tract infection.
- Giving that hospital deliveries encounter more risky deliveries than other deliveries conducting community base studies could reveal different risk factors.