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"Safety assessment of dexamethasone administration during pregnancy: A Cross-Sectional study"

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ABSTACT:

Background: Dexamethasone, a glucocorticoid drug, is used to treat a variety of conditions, including rheumatism, severe allergies, asthma, chronic obstructive lung disease, croup, brain swelling, eye pain after eye surgery, superior vena cava syndrome (a side effect of some types of cancer), and tuberculosis in conjunction with steroids.**Aim of the study**: The present study aims to evaluate the extent of the safe use of the drug dexamethasone, its effectiveness, and its side effects on pregnant women. **Material and Method**: 484 participants were surveyed using a paper questionnaire that included several information about social and drug side effects. The data were analyzed statistically by using SPSS v. 27. **Results**: our results suggest that there is no statistically significant association between taking dexamethasone during pregnancy and the occurrence of hypertension, diabetes, need for hospitalization, or depression and psychological pressure. However, there is a statistically significant association between taking dexamethasone and the awareness of lung acupuncture. **Conclusion:** Dexamethasone use during pregnancy is not substantially linked to an elevated risk of common pregnancy-related problems, such as gestational diabetes mellitus and hypertensive disorders of pregnancy, according to the study's findings. Hospitalization due to pregnancy, psychological anguish, or depression.

Keywords: dexamethasone, pregnancy, side effects

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Libyan 19-2

INTRODUCTION

Dexamethasone is a potent synthetic glucocorticoid used in the treatment of a wide range of inflammatory and autoimmune diseases. It is commonly indicated for rheumatic disorders, dermatological diseases, severe allergic reactions, asthma, chronic obstructive pulmonary disease, cerebral edema, ocular inflammation, and as an adjunct in tuberculosis management. Additionally, it is administered to reduce intracranial pressure, alleviate postoperative ocular pain, and manage complications such as superior vena cava syndrome in malignancy. In cases of adrenocortical insufficiency, dexamethasone is used in combination with mineralocorticoids such as fludrocortisone. The drug can be administered orally, intravenously, intramuscularly, and topically, with its effects typically observed within 24 hours and lasting up to 72 hours (1, 2). Pregnancy is a critical period that requires special medical consideration to ensure the safety of both the mother and the fetus. Dexamethasone is frequently used during pregnancy to manage maternal inflammatory and allergic conditions and, importantly, to enhance fetal lung maturation in preterm labor. This corticosteroid accelerates surfactant production and reduces the risk of neonatal respiratory distress syndrome when administered antenatally. Furthermore, it plays a role in preventing complications related to Rh incompatibility between the mother and fetus (3,4). The present study aims to explore the effects of dexamethasone use during pregnancy, focusing on its therapeutic benefits, safety profile, and potential adverse outcomes in both the mother and fetus. This research seeks to provide a comprehensive overview of current clinical practices, recent scientific developments, and evidence-based recommendations regarding the use of dexamethasone in obstetric care. Dexamethasone influences multiple physiological processes, including fetal hormonal regulation, lung maturation, and neurological development. Previous studies have investigated its effects on the hypothalamic–pituitary–adrenal (HPA) axis and neurodevelopment, showing variable outcomes depending on the timing and dosage of exposure (5). Long-term or repeated dexamethasone use can result in adverse effects such as oral candidiasis, osteoporosis, cataracts, skin thinning, and muscle weakness. In the United States, dexamethasone is classified as pregnancy category C, meaning it should be prescribed only when potential maternal benefits outweigh possible fetal risks. In contrast, oral dexamethasone is categorized as pregnancy category A in Australia, reflecting frequent safe use without documented harm to the fetus. Despite its therapeutic utility, dexamethasone is generally not recommended during breastfeeding due to potential neonatal exposure (6, 7). This study aims to evaluate the extent of the safe use of the drug dexamethasone, its effectiveness, and its side effects on pregnant women.

MATERIAL AND METHOD

Study Sample

A descriptive, cross-sectional observational study was based on data collected from 484 cases during the period between February 1, 2024, and April 1, 2024. The data focused on the use of dexamethasone and its safety in the [Zawiya and Western regions of Libya]

Study Tools

The study tool was represented in a questionnaire form containing some data, such as age, educational level, number of previous births, some questions about the use of dexamethasone, and other risk factors, by distributing the questionnaire to the target group. The data have been analyzed, and the percentage of each question in the questionnaire has been calculated. The results will be presented through tables and figures in the fourth section.

statistical analysis

Descriptive statistical analyses were performed using SPSS version 27, with results presented as frequencies, percentages, and tables to illustrate participant distribution, maternal health conditions during pregnancy, and prevalence of adverse effects.

Ethical Considerations

This study did not require formal ethical approval because it involved a non-interventional, anonymous questionnaire that posed no physical, psychological, or social risk to participants. All participants were informed about the purpose of the study, and voluntary informed consent was obtained before participation. No personal identifiers were collected, and all responses were kept strictly confidential and used solely for research purposes.

RESULT:

Table 1: Socio-demographic characteristics of the participants

Economic and social factors	Taking dexamethasone				Chi square	P-value
	Yes		No			
	Count	%	Count	%		
Education level of mother						
Higher education	197	41.0	193	40.2	2.347	0.309
Basic education	32	6.7	46	9.6		
Not educated	6	1.3	6	1.3		
Employment status of mother						
Worker	157	32.7	150	31.3	1.623	0.203
House wife	78	16.3	95	19.8		
Education level of husband						
Higher education	179	37.3	191	39.8	3.836	0.147
Basic education	53	11.0	45	9.4		
Not educated	3	0.6	9	1.9		
Employment status of husband						
Working	223	46.5	228	47.5	0.709	0.400
Not working	12	2.5	17	3.5		
Economic level						
High income	49	10.2	50	10.4	1.214	0.545
Moderate income	172	35.8	174	36.3		
Weak income	14	2.9	21	4.4		

The findings revealed that a large proportion of the mothers (81.3%) had attained higher education, while only a small fraction (2.5%) was uneducated. More than half (64%) of the participants were employed, and nearly all husbands (94%) were working, with most having higher education (77.1%). The majority of the families belonged to the moderate-income category (72.1%), and two-thirds of the women lived in urban areas (66%), The demographic profile suggests that most participants come from an educated and socioeconomically stable background. The predominance of urban residence and dual parental employment likely reflects better access to healthcare services and pregnancy monitoring opportunities.

Table 2. Obstetric and neonatal characteristics

Variable	Category	Count	Percentage (%)
Mother's Age	Less than 20	30	6.3
	20–34 years	365	76.0
	35 or more	85	17.7
Birth Order	First	180	37.5
	Second or third	199	41.5
	Fourth or above	101	21.0
Type of Delivery	Normal delivery	224	46.7
	Caesarean delivery	256	53.3
Birth Weight	Underweight	56	11.7
	Normal weight	366	76.3
	Overweight	58	12.1
Pregnancy Monitoring	No visit	28	5.8
	Four or more visits	187	39.0
	Weekly visit	265	55.2

Most mothers were aged between 20 and 34 years (76%), with 17.7% aged 35 years or older. The majority were having their second or third child (41.5%), and the proportion of first-time mothers was 37.5%. Caesarean section deliveries were slightly more frequent (53.3%) than normal vaginal births

(46.7%). Regarding antenatal care, most women (55.2%) reported weekly visits to health facilities, while only 5.8% had no antenatal care. Normal birth weight was the most common (76.3%) among newborns. These findings indicate that most pregnancies occurred within the optimal reproductive age range. The high rate of regular antenatal follow-up suggests good maternal health awareness. The prevalence of caesarean delivery, however, points to the growing medicalization of childbirth, which may warrant further clinical evaluation.

Table 3. Maternal health conditions during pregnancy

Variable	Category	Count	Percentage (%)
Hypertension	Yes	119	24.8
	No	361	75.2
Diabetes	Yes	67	14.0
	No	413	86.0
Required Hospitalization	Yes	125	26.0
	No	355	74.0
Depression / Psychological Pressure	Yes	361	75.2
	No	119	24.8

Hypertension was reported in 24.8% of the mothers, while gestational diabetes affected 14%. Hospitalization during pregnancy was required in about one-fourth of the participants (26%). Notably, a large proportion (75.2%) reported symptoms of psychological stress or depression during pregnancy; the presence of hypertension and diabetes among a notable minority of participants underscores the importance of regular antenatal screening. The high level of psychological stress suggests that emotional well-being is a significant yet often overlooked aspect of maternal health. Integrating mental health support into prenatal programs may therefore improve overall outcomes.

Table 4. Awareness and experience with pulmonary acupuncture

Variable	Category	Count	Percentage (%)
Awareness of lung acupuncture	Yes	437	91.0
	No	43	9.0
Previous lung acupuncture taken	Yes	235	49.0
	No	245	51.0

Most mothers (91%) were aware of lung-related acupuncture, and nearly half (49%) had previously received this type of therapy. The strong awareness and moderate utilization of pulmonary acupuncture reflect growing interest in complementary medical approaches among pregnant women. This trend highlights the potential for integrating safe alternative therapies alongside conventional obstetric care, provided they are guided by medical supervision.

DISCUSSION:

The findings of this study provide a comprehensive overview of the sociodemographic, obstetric, and clinical characteristics of the participating pregnant women, offering valuable insight into their general health status and healthcare utilization patterns. Notably, the majority of mothers (81.3%) and their husbands (77.1%) had higher education, with only 2.5% reporting no formal education. This reflects a predominantly well-educated population, which may facilitate better health literacy and improved adherence to antenatal care. High employment rates among husbands (94.0%) and mothers (64.0%), along with predominantly urban residence (66.0%) and moderate-income levels (72.1%), further indicate a relatively advantaged socioeconomic context that likely contributes to increased access to healthcare services and more consistent prenatal follow-up [8,9]. The obstetric profile of the participants shows that most women were within the optimal reproductive age (20–34 years; 76.0%), although 17.7% were 35 years or older, a group typically considered at higher risk for obstetric complications and therefore requiring closer monitoring [10]. Birth order distribution showed that 41.5% were multiparous (second or third birth),

while primiparas represented 37.5%. Importantly, antenatal care utilization was high, with 55.2% attending weekly visits and only 5.8% reporting no prenatal care. This pattern underscores the population's strong engagement with antenatal health services. Cesarean section was slightly more common (53.3%) than normal delivery (46.7%), consistent with the global rise in medically-assisted childbirth, warranting further investigation into its medical and non-medical drivers [11].

Neonatal outcomes were largely favorable, with 76.3% of newborns having normal birth weight, while overweight and underweight cases accounted for 12.1% and 11.7%, respectively. Maternal clinical characteristics revealed substantial health challenges. Hypertension (24.8%) and gestational diabetes (14.0%) were relatively common, highlighting the need for rigorous prenatal screening and effective chronic disease management during pregnancy [12]. Moreover, 26.0% of participants required hospitalization during pregnancy, and a remarkably high proportion (75.2%) reported psychological stress or depressive symptoms. This exceptionally high prevalence emphasizes the critical need to integrate mental health assessment and support within routine maternal care pathways [13].

The analysis of pregnancy outcomes in relation to dexamethasone use demonstrated no statistically significant association with key maternal complications. The incidence of hypertensive disorders was nearly identical between users (12.3%) and non-users (12.5%), with no significant difference ($\chi^2 = 0.024$, $p = 0.876$). Although theoretical mechanisms suggest that glucocorticoids may influence blood pressure, the present findings indicate that short-term therapeutic antenatal dexamethasone does not increase hypertensive risk, aligning with a previous study of Skalkidou (2022) [8]. Similarly, the incidence of gestational diabetes was comparable between users (6.9%) and non-users (7.1%) ($\chi^2 = 0.003$, $p = 0.958$). While chronic corticosteroid exposure may impair glucose tolerance, short-term dosing appears to have minimal metabolic impact, consistent with earlier findings [11]. Furthermore, no significant differences were observed in hospitalization rates (14.0% vs. 12.1%; $p = 0.227$) or psychological stress levels (37.7% vs. 37.5%; $p = 0.368$) between the two groups. Existing literature primarily associates mood disturbances with prolonged, high-dose corticosteroid use[12]. and the present results support the minimal psychological impact of short-term treatment. A notable finding was the significantly higher awareness of pulmonary acupuncture among dexamethasone users (48.8%) compared with non-users (42.3%) ($\chi^2 = 41.102$, $p < 0.001$). Previous research suggests that women exposed to medical interventions during pregnancy may have greater interest in complementary therapies [13]. . This underscores the importance of providing structured education on safe and evidence-based complementary practices during antenatal care [14]. In summary, the study population demonstrated strong engagement with healthcare services and favorable socioeconomic characteristics, yet faced high psychological stress levels and increasing reliance on medicalized childbirth. The findings collectively highlight the need for integrating mental health services, ensuring appropriate use of obstetric interventions, and guiding safe adoption of complementary therapies during pregnancy**.**

CONCLUSION:

Dexamethasone use during pregnancy is not substantially linked to an elevated risk of common pregnancy-related problems, such as gestational diabetes mellitus and hypertensive disorders of pregnancy, according to the study's findings hospitalization due to pregnancy, psychological anguish, or depression. According to the factors evaluated in this study, these findings imply that dexamethasone does not seem to have a negative impact on maternal health outcomes when given during pregnancy. There was a statistically significant correlation between the use of dexamethasone and increased knowledge of lung acupuncture, though, which might be due to this subgroup's stronger health literacy or greater usage of complementary and alternative medicine (CAM) treatments.

The comparable rates of maternal complications and neonatal outcomes highlight the potential role of dexamethasone as a beneficial therapeutic option in managing pregnancy-related conditions, particularly when fetal lung maturation or maternal indications warrant its use. Importantly, these results support the growing body of evidence affirming the safety profile of antenatal corticosteroid therapy when administered according to established clinical guidelines. Nevertheless, continued vigilance is necessary to ensure appropriate dosing, timing, and patient selection. In summary, dexamethasone appears to be a safe and effective intervention for pregnant women when judiciously prescribed, emphasizing the importance of evidence-based practice in maternal-fetal medicine.

Study limitations

This study has several limitations that should be acknowledged. The cross-sectional design limits the ability to infer causality between dexamethasone use and pregnancy outcomes. Data collection relied partly on self-reported information, which may introduce recall bias. The study sample was predominantly composed of urban and well-educated women, potentially reducing the generalizability of the findings to other populations. The sample size may also have been insufficient to detect rare adverse events associated with dexamethasone use. Furthermore, the study did not include a long-term follow-up to assess possible delayed neonatal or developmental.

Recommendations

Based on the results of this study, it is recommended that dexamethasone use during pregnancy continue in accordance with established clinical guidelines to ensure the safety of both mother and fetus.

Regular monitoring of maternal health parameters and neonatal outcomes should be maintained, particularly in populations with comorbid conditions or limited access to healthcare. Further large-scale, prospective studies are warranted to confirm the safety profile of dexamethasone, evaluate potential rare or long-term adverse effects, and optimize dosing and timing strategies. Additionally, integrating mental health assessment and support into routine prenatal care is encouraged, given the high prevalence of psychological stress observed among pregnant women.

Competing interests

The authors have declared that there are no competing interests

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