Original Article
DOI: https://doi.org/10.70749/ijbr.v3i7.2322

INDUS JOURNAL OF BIOSCIENCE RESEARCH
https://ijbr.com.pk
ISSN: 2960-2793/ 2960-2807

Dexamethasone before Elective Caesarean Section at Term in Reducing Respiratory Distress Syndrome

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ARTICLE INFO

Keywords: Dexamethasone, Elective caesarean delivery, Respiratory distress syndrome, Neonatal outcome.

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Declaration
Authors' Contribution: Both authors equally contributed to the study and approved the final manuscript.

Conflict of Interest: No conflict of interest.

Funding: No funding received by the authors.

Article History
Received: 03-06-2025 Revised: 29-06-2025
Accepted: 07-07-2025 Published: 15-07-2025

ABSTRACT

Background: Neonatal respiratory distress syndrome is a common cause of neonatal morbidity following elective term caesarean section. It has been demonstrated that antenatal use of corticosteroids reduces neonatal respiratory distress syndrome incidence but such a benefit has not been determined at or before term caesarean section. Various studies have investigated dexamethasone as a potential prophylactic drug against neonatal respiratory distress. **Objective:** To compare the efficacy of dexamethasone and without dexamethasone before elective caesarean section at term in reducing respiratory distress syndrome. **Study Design:** Randomized controlled trial. **Duration and Place of Study:** The study was carried out from December 2024 to May 2025 in the Department of Obstetrics and Gynecology, Rawal Institute of Health Sciences, Islamabad. **Methodology:** A total of 550 women aged 18 to 40 years with singleton pregnancies beyond 36 weeks and scheduled for elective caesarean delivery were included. Participants were randomly allocated into two groups: Group A received two intramuscular doses of 12 milligrams dexamethasone at a 12-hour interval, completed 48 hours prior to surgery, while Group B received no steroid. All procedures were performed under spinal anesthesia with neonatal assessment by a specialist. Respiratory distress syndrome was defined by Downe's score between three and six with an oxygen requirement less than 0.6, together with recurrent apneic episodes greater than two within twelve hours without resuscitation. **Results:** Neonatal efficacy was observed in 97.8 percent of the dexamethasone group compared with 89.8 percent in the control group ($p<0.001$). Subgroup analysis showed superior outcomes with dexamethasone in women with gestational age beyond thirty-nine weeks, parity greater than three, and previous history of neonatal respiratory distress syndrome. **Conclusion:** Dexamethasone given prior to elective caesarean delivery at term significantly reduces the occurrence of neonatal respiratory distress syndrome and may be recommended as prophylactic therapy.

INTRODUCTION

Neonate respiratory distress syndrome is a clinically important illness caused by compromised pulmonary function secondary to a failure of surfactant synthesis and resulting alveolar collapse and hypoxemia with increased work of breathing.[1] Although more frequent in preterm infants, term newborns delivered by elective caesarean section are equally likely to suffer due to a lack of labor-related hormonal and physiologic changes favoring clearance of pulmonary fluid and release of surfactant.[2] Clinical presentation is prone to include tachypnea, nasal flaring and grunting and chest retractions and radiographic findings reveal reticulogranular pattern and diminished compliance of the lungs. Although better care of the neonate has developed since, respiratory distress syndrome still significantly contributes early neonatally generated morbidity and at worst mortality.[3]

Prevention of respiratory distress syndrome is mostly dependent on optimization of perinatal care to effect pulmonary maturity and successful conversion to extrauterine life. Antenatal corticosteroids are the gold standard intervention in preterm deliveries because they can hasten surfactant production and structural development of fetal lungs.[4,5] It is highly recommended that elective caesarean section after 39 weeks of gestation is put on hold in order to decrease respiratory complications among neonates.[6] Non-invasive ventilation support and replacement of surfactant are successful adjuncts when preventive maneuvers are futile. Prompt gestational delivery at birth, optimization of medical health of the mother, and avoidance of unnecessary early intervention are key features of care that significantly ensure neonates' susceptibility to respiratory compromise is minimized.[7]

Pre-treatment of dexamethasone before elective term caesarean section has been found to be a tool of

compensating the added risk of respiratory distress syndrome of the newborn when it is born after being deprived of the physiological advantage of labor.[8,9] Corticosteroids such as dexamethasone augment surfactant synthesis, alveolar stability and fetal pulmonary fluid and associated resorption and hence aid neonate adaptation at birth to spontaneous respiration.[10,11] Evidence of clinical practice suggests antenatal treatment with dexamethasone at term caesarean section and associates it with reduced incidence of cases of respiratory morbidity, reduced admissions of neonate to neonatal intensive care units and reduced ventilation requirements.[12] Hence, selective pre-treatment of dexamethasone before elective caesarean section can play the role of a useful preventive drug and can bring about better respiratory outcome of neonates and reduced hospital incidence of respiratory distress syndrome.[12]

Salem MN et al. reported that administration of dexamethasone prior to elective caesarean section at term demonstrated an efficacy of 99.2% in reducing respiratory distress syndrome, compared with 95.3% in the control group.[13]

Elective caesarean sections are increasingly common in Pakistan, but neonatal respiratory distress syndrome remains a frequent cause of early morbidity and mortality. Local information is limited on the employment of antenatal corticosteroids, particularly dexamethasone, at term caesarean deliveries. This research will therefore provide regionally applicable information to guide practice, achieve the best neonatal outcomes, and prevent avoidable complications of respiratory distress syndrome.

METHODOLOGY

This randomized controlled trial was carried out in the Department of Obstetrics and Gynecology at Rawal Institute of Health Sciences, Islamabad, over a six-month period extending from December 2024 to May 2025. Approval for the study was granted by the institutional ethics review board prior to the commencement of recruitment. The sample size was derived using the World Health Organization calculator, applying a 95% confidence interval with a power of 80%. An anticipated efficacy of 99.2% in the dexamethasone group compared with 95.3% in the control group was used to obtain the required number of participants.[13] A total of 550 women were enrolled, with equal allocation to the intervention and control arms. Eligible women were those aged between 18 and 40 years, carrying a singleton pregnancy confirmed on ultrasound, with gestational age beyond 36 weeks based on last menstrual period, and scheduled for elective caesarean delivery, irrespective of parity. Women with a history of preeclampsia, diabetes mellitus, antepartum hemorrhage, or known fetal anomalies were excluded from the trial.

Written informed consent was obtained after full explanation of the study purpose, potential benefits, and associated risks. Demographic details including maternal age, gestational age at delivery, parity, and any prior neonatal history of respiratory distress were documented. All enrolled participants underwent detailed obstetric assessment and were randomized by block technique into two groups of equal size. Women in Group A were administered two intramuscular doses of 12 mg dexamethasone at a 12-hour interval, completed 48 hours prior to surgery. Women in Group B did not receive any steroid prophylaxis. Elective caesarean sections in both groups were performed under spinal anesthesia by senior residents under consultant supervision, and deliveries were attended by neonatologists. Respiratory distress syndrome in newborns was defined as the simultaneous presence of mild to moderate respiratory difficulty, indicated by a Downe's score between 3 and 6 with an oxygen requirement less than 0.6, together with recurrent apneic spells exceeding two episodes within 12 hours, not necessitating resuscitation. Neonatal assessment was carried out immediately after birth and findings were recorded on a structured proforma.

Data were processed using IBM SPSS version 26. Quantitative variables were summarized as mean with standard deviation or median with interquartile range, depending on distribution confirmed by the Shapiro–Wilk test. Categorical variables were expressed as frequencies and percentages. Comparison of proportions between the two groups was performed with the chi-square test, while Fisher's exact test was applied where appropriate. A probability value of ≤0.05 was taken as statistically significant. Stratified analysis was further conducted for maternal age, gestational age, parity, and neonatal history of respiratory distress to control for potential confounding.

RESULTS

Patient demographics showed comparable baseline characteristics between groups, with mean ages of 30.91±3.30 years versus 31.19±4.24 years, gestational ages of 39.10±0.89 weeks versus 39.02±0.96 weeks, and parity of 2.35±1.68 versus 2.44±1.70 for Groups A and B respectively. History of respiratory distress syndrome (RDS) was present in 48 patients (17.5%) in Group A and 41 patients (14.9%) in Group B, while 227 patients (82.5%) in Group A and 234 patients (85.1%) in Group B had no prior RDS history (as shown in Table 1).

Table 1

Patient Demographics

Demographics		Group A (Dexamethasone)	Group B (Without Dexamethasone)
Age (years)		30.91±3.30	31.19±4.24
Gestational Age (weeks)		39.10±0.89	39.02±0.96
Parity		2.35±1.68	2.44±1.70
History of RDS	Yes n (%)	48 (17.5%)	41 (14.9%)
	No n (%)	227 (82.5%)	234 (85.1%)

The primary efficacy comparison demonstrated significantly superior outcomes in the dexamethasone group, with 269 patients (97.8%) achieving efficacy in Group A compared to 247 patients (89.8%) in Group B, while treatment failure occurred in only 6 patients (2.2%) in Group A versus 28 patients (10.2%) in Group B, yielding a statistically significant difference (p<0.001) (as shown in Table 2).

Table 2

Comparison of Efficacy between the Two Groups (N=550)

Efficacy	Group A n=275 n (%)	Group B n=275 n (%)	P value
Yes	269 (97.8%)	247 (89.8%)	
No	6 (2.2%)	28 (10.2%)	<0.001
Total	275 (100%)	275 (100%)	

For patients aged ≤30 years, efficacy rates were 119/122 (97.5%) in Group A versus 102/102 (100.0%) in Group B (p=0.247, Fischer Exact Test), while for patients >30 years, efficacy was 150/153 (98.0%) in Group A compared to 145/173 (83.8%) in Group B (p<0.001, Fischer Exact Test). Gestational age stratification showed that for pregnancies ≤39 weeks, efficacy was 133/133 (100.0%) in Group A versus 125/145 (86.2%) in Group B (p<0.001, Fischer Exact Test), whereas for pregnancies >39 weeks, rates were 136/142 (95.8%) in Group A and 122/130 (93.8%) in Group B (p=0.555). Parity analysis demonstrated that for patients with ≤3 previous births, efficacy was 213/219 (97.3%) in Group A versus 198/208 (95.2%) in Group B (p=0.338), while for those with >3 births, rates were 56/56 (100.0%) in Group A compared to 49/67 (73.1%) in Group B (p<0.001, Fischer Exact Test). Among patients with prior RDS history, efficacy was 42/48 (87.5%) in Group A versus 27/41 (65.9%) in Group B (p=0.031), and for those without RDS history, rates were 227/227 (100.0%) in Group A compared to 220/234 (94.0%) in Group B (p<0.001, Fischer Exact Test) (as shown in Table 3).

Table 3

Association of Efficacy with Demographic Variables

Demographics variables		Groups	Efficacy		P-value
			Yes (n, %)	No (n, %)	
Age (years)	≤30	A	119 (97.5%)	3 (2.5%)	0.247*
		B	102 (100.0%)	0 (0.0%)	
	>30	A	150 (98.0%)	3 (2.0%)	<0.001*
		B	145 (83.8%)	28 (16.2%)	
Gestational Age (weeks)	≤39	A	133 (100.0%)	0 (0.0%)	<0.001*
		B	125 (86.2%)	20 (13.8%)	
	>39	A	136 (95.8%)	6 (4.2%)	0.555
		B	122 (93.8%)	8 (6.2%)	
Parity	≤3	A	213 (97.3%)	6 (2.7%)	0.338
		B	198 (95.2%)	10 (4.8%)	
	>3	A	56 (100.0%)	0 (0.0%)	<0.001*
		B	49 (73.1%)	18 (26.9%)	
History of RDS	Yes	A	42 (87.5%)	6 (12.5%)	0.031
		B	27 (65.9%)	14 (34.1%)	
	No	A	227 (100.0%)	0 (0.0%)	<0.001*
		B	220 (94.0%)	14 (6.0%)	

*Fischer Exact Test

DISCUSSION

This research demonstrates that prophylactic dexamethasone ADMINISTRATION before elective caesarean section at term reduces neonatal respiratory distress syndrome incidence considerably; efficacy was 97.8% compared to controls' 89.8%. Such a high efficacy can be attributed to dexamethasone's potent glucocorticoid activity that is capable of advancing fetal lung maturation due to stimulation of surfactant phospholipid and surfactant-associated protein synthesis, primarily surfactant protein-A and surfactant protein-B. Type II pneumocyte structural maturation rises and alveolar epithelial cell differentiation is stimulated; lung compliance and air-liquid interface surface tension decline consequently.

Increased efficacy in patients over 30 who received dexamethasone most likely corresponds to higher maternal levels of cortisol binding globulin and alternative steroid metabolism typical of advancing maternal age and necessitating exogenous supplementation of corticosteroids to optimize fetal lung maturation. The compelling advantage in those cases at or below 39 weeks gestation corresponds to physiological intuition that endogenous surges of cortisol tend to occur closer to term and that earlier gestational ages may both be deprived of natural steroid exposure to reach complete maturation of lungs. Interestingly, optimal benefit was realized in multiparous patients and may be a reflection of the phenomenon that placental production of corticotropin-releasing hormone dwindles progressively with parity and which compels attenuated maternal-fetal cortical hormone transfer. Improved efficacy in patients who have had a history of a previous RDS suggests that familial or genetic predispositions or determinants acting upon surfactant production can be circumvented effectively by drug therapy and holds promise therapeutically in high-risk categories for antenatal steroid therapy.

The findings of the present study demonstrate remarkable consistency with several published investigations while revealing important discrepancies with others, highlighting the complex interplay of methodological factors influencing antenatal corticosteroid efficacy. Our observed efficacy rate of 97.8% in the dexamethasone group closely parallels the findings of Wali et al. [14] who reported 97.1% effectiveness in preventing RDS among 175 women receiving 12 mg dexamethasone administered twice, 12 hours apart. This striking similarity proves that our dosing regimen and timing may have achieved optimal therapeutic levels for lung maturation.[15] Similarly, Salem et al. [13] demonstrated significant reductions in RDS (0.8% vs 4.7%, p=0.001) and TTN (2% vs 14.9%, p=0.001) using an identical two-dose 12 mg protocol, supporting our findings of superior respiratory outcomes with dexamethasone intervention.

Ahmed et al. [16] corroborated our results with overall respiratory distress occurring in 7.9% versus 23.2% of controls (p=0.002), while Mushtaq et al. [17] reported RDS rates of 8.6% versus 25.7% (p=0.007) using a four-dose 6 mg regimen, both demonstrating the consistent protective effect of antenatal steroids across different dosing strategies. These concordant findings likely reflect adequate tissue penetration and sustained glucocorticoid receptor activation necessary for surfactant synthesis, regardless of the specific dosing schedule employed.

However, our results contrast sharply with several studies that failed to demonstrate clinical benefit. Tan et al. [18] found no significant differences in special care nursery admissions (8.7% vs 8.8%, p=0.689) or mechanical ventilation requirements (3.9% vs 3.8%, p=0.951) using a single 12 mg dose, suggesting that single-dose administration may provide insufficient duration of steroid exposure for optimal lung maturation. More concerning, Jayawardane et al. [19] reported increased

respiratory distress in the steroid group (19.2% vs 7.2%, RR 2.67, p<0.001), which may be attributed to their extended administration window of up to 7 days before delivery, potentially allowing steroid effects to wane before the critical peridelivery period.

The null findings reported by Elbohoty et al. [20] who observed non-significant reductions in TTN (15.47% vs 20.33%, p=0.227) and RDS (6.63% vs 9.89%, p=0.260) despite using a three-dose 8 mg regimen, may reflect suboptimal dosing or timing intervals that failed to achieve sustained therapeutic concentrations. Similarly, Sadiq et al. [21] found no significant differences in respiratory outcomes, which could be explained by their relatively late gestational age cohort (mean 37.9 weeks) where endogenous cortisol production may already be sufficient for lung maturation.

The demographic stratification in our study revealing enhanced efficacy in older mothers, earlier gestational ages, and multiparous patients finds partial support in the literature. Ahmed et al. [16] demonstrated that dexamethasone effects were most pronounced at 37+0 to 37+6 weeks, reducing RDS risk 3-fold, which aligns with our findings of greater benefit at earlier gestational ages when endogenous steroid surge may be incomplete. Mushtaq et al. [17] similarly showed significant protection in the 37+1 to 38-week subgroup (RDS 2/39 vs 10/32, p=0.003), supporting the gestational age-dependent response we observed.

Various differences between studies most likely explain critical methodological differences such as dosing intervals, time of administration, selection of gestational age, and outcome parameters. Our positive results may be a consequence of optimal dosing intervals maintaining steroid levels, correct time of administration to achieve peak activity at delivery, and selective exclusion of patients eliminating high-risk scenarios that might obscure findings on respiratory endpoints. Reproducible benefit in many studies utilizing similar protocols suggests antenatal dexamethasone efficacy extensively dependent upon achievement of correct pharmacokinetic measurements such that single doses or long intervals between administrations might be counterproductive to successful therapy.

A number of limitations should be taken into account in interpreting these findings. We carried out a single-center study within a tertiary hospital care institution, which may limit application of findings to other healthcare institutions having different levels of resources and patient populations. We failed to include blinding of healthcare providers or assessors of outcomes in our study design, and this may have introduced observation bias in measurement of respiratory outcomes. We excluded high-risk pregnancies, optimizing internal validity but limiting application of findings to less complicated obstetric cases common in clinical practice. We could not include long-term evaluation of respiratory or neurodevelopmental outcomes due to a rather short follow-up period, and we lacked power to detect rare but serious adverse events. We may have included differences in neonatal protocol and subjective elements in diagnosing transient tachypnea of the newborn in confounding outcome classification. Lack of placebo control in some studies that we compared may have introduced performance bias, and we could only carry out a number of studies referenced in a retrospective manner due to limitations in a direct comparative analysis strength.

CONCLUSION

We have established that prophylactic dexamethasone therapy before elective caesarean section at term reduces dramatically incidence of neonatal respiratory distress syndrome compared to placebo. Therapy was highly superior in efficacy across most demographic subgroups while demonstrated especially strong effects in mothers past thirty years of age, pregnancies at later gestational weeks within the term range, parity status multiparous, and previous history of respiratory distress syndrome. These findings promote routine antenatal dexamethasone use as a highly effective preventive agent against neonatal respiratory morbidity in elective term caesarean deliveries.

Acknowledgments: Gratitude is extended to the departmental healthcare staff for their dedicated efforts, whose careful documentation and systematic handling of patient information proved essential to this work.

REFERENCES

1. Yeganegi M, Bahrami R, Azizi S, Marzbanrad Z, Hajizadeh N, Mirjalili SR, et al. Caesarean section and respiratory system disorders in newborns. Eur J Obstet Gynecol Reprod Biol X. 2024;23:100336. https://doi.org/10.1016/j.eurox.2024.100336.
2. Kurt A, Ulusoy CO, Kurt DS, Özkan S, Dereli ML, Kından A, et al. Impact of antenatal corticosteroid therapy on neonatal respiratory outcomes in late preterm births. BMC Pediatr. 2025;25(1):595. https://doi.org/10.1186/s12887-025-05925-w.
3. Melamed N, Murphy KE, Pylypjuk C, Sherlock R, Ethier G, Yoon EW, et al. Timing of antenatal corticosteroid administration and neonatal outcomes. JAMA Netw Open. 2025;8(5):e2511315. https://doi.org/10.1001/jamanetworkopen.2025.11315.
4. Lee MJ, Guinn D, Lockwood CJ, Martin RJ, Chakrabarti A. Antenatal corticosteroid therapy for reduction of neonatal respiratory morbidity and mortality from preterm delivery. UpToDate. 2025.
5. Gunes S, Sahin S, Bozkurt O, Cezayir B, Bozgul A, Gonulal D, et al. Enhanced vs standard low dose dexamethasone treatment on respiratory outcomes of preterm infants with bronchopulmonary dysplasia. Front Pediatr. 2025;13:1603308. https://doi.org/10.3389/fped.2025.1603308.
6. Sotiriadis A, McGoldrick E, Makrydimas G, Papatheodorou S, Ioannidis JP, Stewart F, et al. Antenatal corticosteroids prior to planned caesarean at term for improving neonatal outcomes. Cochrane Database Syst Rev. 2021;12:CD006614. https://doi.org/10.1002/14651858.CD006614.pub4.
7. Cho GJ, Park CW, Cho KD, et al. A comparison of short- and long-term prognoses between cases with and without antenatal corticosteroid administration in late preterm delivery: a nationwide population-based study. BMC Pregnancy Childbirth. 2025;25(1):148. https://doi.org/10.1186/s12884-024-06851-y.

8. Van der Heijden JEM, Van Elst NM, Van den Broek P, Scheepers HCJ, De Wildt SN, Greupink R. Optimization of the betamethasone and dexamethasone dosing regimen during pregnancy: a combined placenta perfusion and pregnancy physiologically based pharmacokinetic modeling approach. Am J Obstet Gynecol. 2025;232(2):228.e1-228.e9. https://doi.org/10.1016/j.ajog.2024.11.012.
9. Chawanpaiboon S, Wutthigate P, Anuwutnavin S, et al. Double-blind, non-inferiority, randomized controlled trial of dexamethasone 4, 5 and 6 mg for preventing adverse neonatal and maternal outcomes in very preterm to late preterm pregnancies between 29 0 and 36 6 weeks of gestation: study protocol. Reprod Health. 2025;22(1):30. https://doi.org/10.1186/s12978-025-01965-8.
10. Jost V, Fluhr H, Helmer H, et al. Commentary: antenatal corticosteroid prophylaxis in late preterms– short- and long-term effects and many open questions. BMC Pregnancy Childbirth. 2025;25(1):197. https://doi.org/10.1186/s12884-025-07316-6.
11. Tosto V, Scala C, Fratelli N, Fichera A, Familiari A, Londero AP, et al. Antenatal corticosteroids in early and late fetal growth restriction. J Clin Med. 2025;14(14):4876. https://doi.org/10.3390/jcm14144876.
12. Atallah K, Moon S, Lee IL, Pszczola R, Said JM. Maternal and neonatal outcomes following antenatal corticosteroids in pregnancies complicated by diabetes: a scoping review. AJOG Glob Rep. 2024;4(4):100416. https://doi.org/10.1016/j.xagr.2024.100416.
13. Salem MN, Abbas AM, Ashry M. Dexamethasone for the prevention of neonatal respiratory morbidity before elective cesarean section at term. Proc Obstet Gynecol. 2016;6(3):2. https://doi.org/10.17077/2154-4751.1321
14. Wali Z, Gohar S, Waseem S, Afzal M. Efficacy of antenatal corticosteroid injection in the prevention of neonatal respiratory distress syndrome after elective caesarean section at term pregnancy. Pak J Med Health Sci. 2021;15(8):1874-1876. https://doi.org/10.53350/pjmhs211581874
15. Brownfoot FC, Crowther CA, Middleton P. Different corticosteroids and regimens for accelerating fetal lung maturation for women at risk of preterm birth. Cochrane Database Syst Rev. 2008;4:CD006764. https://doi.org/10.1002/14651858.CD006764.pub2.
16. Ahmed MR. Antenatal dexamethasone prior to term elective caesarean section and incidence of neonatal respiratory morbidity: a randomized trial. Suez Canal Univ Med J. 2012;15(2):32-39. https://doi.org/10.21608/scumj.2012.54794
17. Mushtaq I, Nawaz R, Waheed SS, Khalid M. Effect of dexamethasone for prevention of neonatal respiratory distress syndrome in mothers undergoing elective caesarean section. Pak J Med Health Sci. 2021;15(9):2387-2389. https://doi.org/10.53350/pjmhs211592387
18. Tan ACC, Kumar HK, Hazli NFL, Ling C. Is lower dose of intramuscular dexamethasone injection beneficial in reducing neonatal respiratory morbidity for elective caesarean section deliveries at 37 to 38 weeks? An observational study. Med J Malaysia. 2021;76(5):624-629. https://www.e-mjm.org/2021/v76n5/dexamethasone-injection.pdf
19. Jayawardane M, Piyadigama I, Chandradeva U. A retrospective cohort study on effects of antenatal steroids on respiratory morbidity for term elective caesarean sections in South Asian women. F1000Research. 2022;11:827. https://doi.org/10.12688/f1000research.74870.1.
20. Elbohoty SB, Dawood AS, Abbas AM, Elgergawy AE. The neonatal outcomes of dexamethasone administration before scheduled cesarean delivery at term: a randomized clinical trial. Int J Reprod Contracept Obstet Gynecol. 2020;9(3):1222-1227. https://doi.org/10.18203/issn.2320-1770.ijrcog20201393.
21. Sadiq H, Sohail I. Effects of prophylactic maternal dexamethasone administration on the neonatal respiratory outcomes at term after elective caesarean section: randomized controlled trial. Khyber Med Univ J. 2019;11(1):6-11. https://doi.org/10.35845/kmuj.2019.18762