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Impact of COVID19 Pandemic Lockdown on Ophthalmic Screening of Preterm Neonates in a Tertiary Care Hospital of Uttarakhand

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Abstract: ***Context: A preterm birth is known to manifest with long term challenges for the developing visual system to cope with. The changes made to lifestyle, and working conditions during COVID19 pandemic with a nationwide lockdown, saw a decrease in ophthalmic cases and consultations including referrals of preterm births. Aims: This study was done to assess the impact of the lockdown on ophthalmic references of preterms in a tertiary care hospital in Uttarakhand. Settings and Design: Cross sectional hospital based study. Methods and Material: A cross sectional hospital based study wherein a preterm birth was considered a case for ophthalmic evaluation. Only preterms born in the institution were included. Those preterms born outside yet screened for ophthalmic assessment were excluded from the study. Statistical analysis used: Anova test, Chi-square test. Results: The study states a significant decrease in ophthalmic services in the lockdown period. We saw a statistically significant decline in referrals of preterm births during the lockdown period implying a decrease in preterm births. Conclusions: A change in the external environment like a lockdown with cessation of outdoor activities seemed to have a favourable impact on preterm birth, with probably either because of increase in gestational age of the preterm or conversion into a term delivery. This study should stimulate the related fields to explore factors related to preterm births through a different perspective.***

Keywords: COVID-19, Pandemic, ocular anomalies, preterm

Key Messages: Congenital ocular anomalies due to preterm birth need primordial prevention. A change in an external environment can modify an individual internally and result in favourable manifestations.

1. Tables

Table 1: Eye Department 2020

Month	Total Patients in OPD (New +Old)	Average Average IPD	Percentage Percentage IPD (n=40)
January	2632	34.81	87.03%
February	2845	37.17	92.93%
March	1846	34.29	85.73%
April	315	13.39	33.48%
May	510	1.61	4.03%
June	606	2.77	6.93%
July	1022	4.90	12.25%

Table 1 shows low figures both in outpatient services and admitted patients. The month of May recorded the lowest numbers with 4.03% bed occupancy.

Table 2: Monthly Distribution of Ophthalmic references in 2020

Month	Booked preterm (B)	Total preterm(P)	Total deliveries(D)	Percentage B/P%	Percentage B/D%
January	15	42	259	35.71%	5.79%
February	09	45	245	20.00%	3.67%
March	8	51	225	15.69%	3.56%
April	11	45	276	24.44%	3.99%
May	3	47	301	06.38%	0.99%
June	20	86	279	23.26%	7.16%
July	13	71	331	18.31%	3.93%

Table 2 shows the referrals done for ophthalmic consultation on preterm births, in view of any affectations pertaining to eyes, with decrease in Booked preterms in May representing less than one percent of total deliveries conducted in that month. Also, May recorded just about six percent of booked preterm screenings out of total preterm births, suggestive of decrease in preterm births.

Table 3: Number of Ophthalmic Screenings in the LOCKDOWN Period (22nd March to 31st May) year 2019 versus 2020

	Total Delivery in the "LOCKDOWN PERIOD"	Total Preterm delivery in the "LOCKDOWN PERIOD"	BOOKED Preterm births in the "LOCKDOWN PERIOD"
2019	520	59	35
2020	643	107	19
p value		0.01	0.002

*Chi square test

Table 3 shows a significant decrease with a p-value of 0.01in preterm births in the LOCKDOWN of 2020 when compared to similar duration in the year 2019. Also noted was a significant decrease with a p-value of 0.002 declines in the number of booked cases of preterm births which imply that those patients who followed up throughout the antenatal period, and were anticipated to land up prior to 37 weeks, actually saw a conversion to term.

Table 4: Average Gestation of Preterms

Mean	Pre Lockdown 2020	Lockdown 2020	Post Lockdown 2020	P value
Gestational age	32.51	32.52	32.50	0.999

*ANOVA test applied to show the variance between the groups

Table 4 shows the average gestation of preterm births was found to be 32.52 weeks which was statistically not

significant as it was nearly similar to pre and post lockdown gestation.

Background

Preterm birth has a known association with visual impairment, oculomotor abnormalities, and refractive error. [1]These conditions may occur due to an abrupt exposure of an immature visual system to an unfamiliar environment. A Preterm birth usually warrants an ophthalmic reference to rule out certain ocular pathologies and for timely intervention in cases of ocular morbidities. Nationwide lockdown was observed from 22nd March to 31st May 2020 that affected the pattern of ophthalmic cases presenting to the hospital. Due to COVID Pandemic Lockdown in the country, there was noticed a major change in the paradigm of ophthalmic referral (elective and emergency) cases in our institution. The study was conceptualized to know the effect of such unprecedented Lockdown on ophthalmic references of preterm births.

Aim

Through this study, we wanted to assess the impact of the lockdown on ophthalmic references of neonates born preterm in the institute.

2. Material and Methods

It is a cross sectional analytical hospital based study conducted during the period of January 2020 to July 2020.In this study, we included only those preterm neonates who were born in the hospital, and were screened in ophthalmology department to rule out any ophthalmic affectations, if any . We defined preterm according to WHO criteria as babies born alive before 37 weeks of pregnancy. Based on gestational age they were further categorized as Extremely Preterm (less than 28 weeks), Very Preterm (28 to 32 weeks) and Moderate to Late Preterm (32 to 37 weeks). Infants more than one month of age and those either born elsewhere were excluded from the study. Unbooked emergency births which were under antenatal care elsewhere but due to lockdown were referred for deliveries to the hospital were also analysed to draw appropriate comparisons. Ophthalmic references included screenings for congenital abnormalities, red eye, watering, or any other systemic pathology. Screening was done using torch light, direct and indirect ophthalmoscope, and cases with specific ocular morbidities were referred to the concerned subspeciality for further management. Number of screenings prior to, during, and after the lockdown were analysed to assess the impact of lockdown and to note the trend of such references in the backdrop of such unprecedented events. Given the period of lockdown, a pre lockdown period was taken from January 2020 to 21st March 2020, while a post lockdown period was considered from June 1st to July 31st 2020.

3. Discussion

COVID 19 and its repercussions affected the number of people seeking ophthalmic services. Such decline was also noted in other hospitals in the region and also among prominent institutions catering to ophthalmic services. [1] This study shows a decrease in the number of preterm births, significantly in the lockdown period. Globally, prematurity is the leading cause of death among children less than five years of age. Many of those who survive face a lifetime of disability including visual problems. [2, 3] The study by Wadhwa et al had suggested a life-course perspective on stress as the factor for preterm births. They also pointed out that the methodology of Ecological Momentary Assessment (EMA) provided greater ecological validity than laboratory-based measures because they captured response in a naturalistic setting than to a controlled stimulus in a laboratory.[4] Reichmann et al had reported that both ethnicity and birthplace affect the prenatal birth, but the racial differences do not attribute to the postnatal outcomes.[5] A cohort study from Gujarat showed a preterm birth proportion as 8.9%, and considered periodontal disease, and sexual activity in any trimester as significant risk factors for preterm births.[6] In a case control study by Kajeepta et al, participants reported that sleep deprivation and sleep disturbance with sleep hours less than 6 were significantly associated with spontaneous preterm birth. Also vital exhaustion except after exercise was significantly associated with preterm births.[7] A cohort study done in Greece also suggested that women sleeping less than 5 hours with sleep deprivation were at high risk for preterm births. [8] The present study shows that a nationwide lockdown could have been a stimulus resulting in a positive response from a section of society. It was a sudden change in external environment, however might have exercised a positive influence on antenatal patients.

An ophthalmic screening holds relevance in a preterm birth. In a retrospective cohort study in Colorado, it was found that Retinopathy of Prematurity(ROP) has adverse outcomes related to lower gestational age and events in the intrauterine environment which trigger a preterm birth.[9] In a prospective population based study from Sweden, the overall incidence of subnormal vision and strabismus in children born prematurely was higher than normal gestation regardless of presence of ROP or neurological deficit.[10] As per Conner et al, many types of visual deficits including refractive error, strabismus, and cerebral vision impairment are an impact of early exteriorisation of the developing visual system, thus a preterm birth could be a premature for life.[11] In a study to evaluate the risk of development of ocular abnormalities among all premature Asian infants referred for screening, it was recommended that preterm were not only prone for refractive errors, and strabismus, but had a strong association with ROP and needed long term follow up.[12] Oum et al has also suggested the possible ocular alterations in preterms and timely apprising the parents of the likely ocular consequences. [13] A study from China has reported chemosis, epiphora, conjunctival hyperaemia as a separate entity or a combined ocular manifestation in at least a third of the patients with more severe corona virus disease. There is also a reported possibility of transmission of virus via the eyes. [14] A case series on outcomes of laboratory positive COVID-19 pregnant mothers, only one out of three positive for had a preterm delivery which was attributed to psychological stress. No vertical transmission was noted. [15]

In an observational cohort study on neonates born between March 22 and May 17 2020, in New York City, it was found that eight percent (116 out of 1481) mothers tested positive for COVID during that period. Repeated PCR testing was found to be negative in all neonates with no symptoms of COVID-19. It is imperative to point out that that all mothers could practice skin-to-skin care and breast feeding albeit with use of surgical mask. The study was suggestive of an unlikely perinatal transmission of COVID-19. At present there is scant information available regarding the outcomes and possible consequences of COVID infection in pregnant women.

4. Conclusion

The ophthalmology department saw an immense decline in all aspects during the lockdown period including admissions and surgical cases in a multispeciality institution. Such decrease in numbers was also noted in ophthalmic screenings of preterm births, which ironically is an optimistic sign. Lockdown probably favoured antenatal cases and motivated them to the extent of converting most of them into term deliveries. Limitation of our study was that we are yet to know if such an impact was a nationwide phenomenon and that it also reflects an ophthalmologist opinion. The facts that the study unfolds needs more angles and facets to be explored to form a hypothesis. However, the study holds importance as it has a unique perspective on stimuli in external environment and social responses to the same.

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