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Original Research Article

The Incidence of Vaginal Micro-Organisms in Pregnant Women with Preterm Labour and Preterm Birth in Vindhya Region

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ABSTRACT

Background: Preterm birth comprises 11% of all live births worldwide and its complications are estimated to cause 35% of world's neonatal deaths, which represents 3.1 million deaths annually. Children who are born prematurely also have higher rates of cardiovascular disorders, respiratory distress syndrome, neurodevelopmental disabilities and learning difficulties compared with children born at term. **Methods:** It was a tertiary hospital based observational prospective study, was carried out at Department of Obstetrics and Gynaecology, S.S. Medical College and Associated G.M.H., REWA (M.P.) in collaboration with Microbiology department, over a period of 15 months 1st January 2021 to 31st March 2022. Antenatal cases coming in the department of obstetrics and gynaecology with complaint of premature pain were selected for study. Cases were randomly selected, who had given informed written consent. **Results**: Total deliveries were 6346, among them 5428 had normal deliveries and 918 had cesarean section; in comparison to the usual figures deliveries were somewhat less due to covid pandemic. Total 472 cases presented with preterm pain, so incidence of preterm in our institute was 8.7%, among 472 cases 172 were true preterm who got delivered, so the incidence of true preterm was 3.4% and 286 cases were threatened preterm that were conservatively managed, so the incidence of threatened preterm was 5.3%. **Conclusion**: Preterm birth is significant toll for neonatal health, hence if we take measures to early identify the cases especially with risk factor of preterm birth at around 24-28 weeks with routine per speculum examination, their treatment empirically/evidence based with these causative agents may help in reduction of this entity of preterm birth.

1. INTRODUCTION

Preterm birth is defined as delivery before 37 completed weeks of gestational age[1]and can be further sub-categorized in: extremely preterm (≤27+6 weeks +days), very preterm (28 to 31+6 days), and late preterm (32 to 36+6days).[2] About 11% of all births occur prematurely, and it is estimated that 35% of all neonatal fatalities, or about 3.1 million per year, are directly attributable to problems associated with prematurity.[3] Cardiovascular diseases, respiratory distress syndrome, neurodevelopmental abnormalities, and learning challenges are all more common in prematurely born children compared to children born on time.[4]

Preterm birth is a complicated multifactorial condition that has a number of known risk factors, including low and high maternal ages,[5-7] low BMI,[8] black ethnicity,[9] tobacco use, heavy alcohol consumption, illicit drug use, close temporal proximity to a previous

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delivery.[10] Despite substantial research, some preterm instances in women without recognised risk factors go unexplained.

Since many of the organisms recovered from the amniotic fluid/membranes of women who gave birth prematurely are also detected in the lower abdomen, it has been postulated that intrauterine infection with organisms ascending from the vagina plays a significant role in preterm birth.[11,12] Given the robust correlation between intra-amniotic bacterial infection and premature birth, a great deal of research lends credence to this theory.[11,12]

The "normal" vaginal micro biota in non-pregnant, reproductive-aged women is thought to be dominated by Lactobacillus species, whereas an abnormal macrobiotic (described as Bacterial vaginosis) is characterised by a deficiency in lactobacilli and an excess of anaerobic bacteria, including Gardnerella vaginalis, Prevotella spp., Bacteroides spp., Mo.[13] According to studies, compared to non-pregnant women, low risk pregnant women's vaginal micro biome has more lactobacilli and less richness and diversity. Although Leitich et al. (2003)[15] found a link between an aberrant micro biota and preterm birth, only a few culture-independent studies of the vaginal microbiota of women who gave birth prematurely have been published, and their results are contradictory.[14,15]

GOALS AND OBJECTIVES:

1. To find out specific vaginal flora associated with preterm labour
2. Incidence of preterm labour
3. Incidence of threatened preterm labour

2. MATERIAL AND METHODS

The present prospective study entitled The incidence of vaginal micro-organisms in pregnant women with preterm labour and preterm birth in Vindhya region was carried out at Department of Obstetrics and Gynaecology, S.S. Medical College and Associated G.M.H.,REWA(M.P.) in collaboration with Microbiology department, over a period of 15 months 1st January 2021 to 31st March 2022.

STUDY DESIGN: Tertiary hospital based observational prospective study.

STUDY POPULATION: Antenatal cases coming in the department of obstetrics and gynaecology with complaint of premature pain were selected for study. Cases were randomly selected, who had given informed written consent.

SELECTION CRITERIA:

Inclusion Criteria: -

1. All female with uterine contractions with and without cervical changes between 28 to 37 weeks with intact membrane.
2. Cephalic presentation.
3. Singleton

Exclusion Criteria: -

1. Gestational age >37 &<28 completed weeks
2. Associated fetal malformations.
3. IUD
4. Ruptured membrane.
5. Uterine anamoly.
6. Medical Disorders like DM, HTN, renal, cardiac, thyroid
7. APH
8. Polyhydroamnios
9. Use of antibiotics in preceding 2 weeks

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10. Cervical incompetence, cervical surgery
11. Patient who were not giving written consent.

Sample Size: -All the 304 patients who were satisfying the inclusion & exclusion criteria in given duration were included in the study, those who did not provide written consent were not included.

Data Collection and Processing

All the cases with complain of premature pain irrespective of age, parity were divided in true preterm labour and threatened preterm labour .

- True preterm labour is : -

a) Gestational age less than 37 weeks,
b) Regular uterine contractions (four or more in 20 minutes or eight or more in 60 minutes) each lasting more than 40 seconds,
c) Cervical dilatation equal to or greater than 1 cm but less than 4 cm,
d) Intact amniotic membranes.

- According to ACOG 1997 threatened preterm labour is defined as documented uterine contraction but no evidence of cervical changes

  Detailed history was acquired using standardized proforma with particulars about age, parity, religion, education, socioeconomic status, and risk factors like history of previous abortion and preterm birth.

  A thorough general and systemic examination was then carried out to exclude women coming under exclusion criteria. A detailed obstetrics examination and Per speculum examination was carried out. High vaginal swabs were collected from posterior fornix avoiding contamination with cervical mucus. Two swab were collected per patient and sent to microbiology department for further assessment, where wet mount preparation and gram staining done, microscopic examination of wet mount preparation carried out for the presence of candida. Three types of bacteria were evaluated by Gram's staining- Staphylococcus Aureus (gram positive cocci), Bacteroides (gram negative rods),group B streptococci. Each second vaginal swab then cultured using a Sabouraud's dextrose agar plate for Candida species. Germ tube test was performed for diagnosis of Candida species.

All the cases were followed till deliveries to see incidence of threatened preterm and actual preterm labour.

OBSERVATIONS:

Table 1 A: Distribution of cases among study populations

Type of preterm	Frequency	Percent
Threatened preterm	196	64.5
True preterm	108	35.5
Total	304	100.0

Out of 304 preterm cases majority were threatened preterm (64.5%) whereas 35.5% were true preterm.

Table 1 B: Comparing study populations with presence of vaginal infections

			Presence of vaginal infection		Total	P value
			No	Yes		
Type of	Threatened	Count	172	24	196	<0.001

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Preterm	preterm	%	87.3%	12.2%	64.5%	
	True preterm	Count	67	41	108	
		%	62.1%	37.9%	35.5%	
Total		Count	239	65	304	
		%			100.0%	

On comparing study populations with presence of vaginal infections a significant difference was observed as revealed by the significant p value of <0.001. Out of 196 threatened preterm 12.2% had vaginal infection whereas out of 108 true preterm 37.9% had vaginal infection.

Table 2A: Distribution according to age

Age; years	Frequency	Percent
<20	25	8.2
20-25	189	62.8
26-30	57	18.8
>30	33	10.2
Total	304	100.0

Distribution according to age showed that majority of women had age between 20-25 years (62.8%) whereas 18.8% had age between 26-30 years. There were 10.2% women who were older than 30 years whereas 8.2% were younger than 20 years in present study.

Table 2B: Comparing age with Presence of vaginal infection

			Presence of vaginal infection		Total	P value
			No	Yes		
Age group	<20	Count	16	9	25	0.25
		%	64%	36%	100%	
	20-25	Count	149	40	189	
		%	78.8%	21.2%	100%	
	26-30	Count	46	11	57	
		%	80.7%	19.3%	100%	
	>30	Count	28	5	33	
		%	84.8%	15.2%	100%	
Total		Count	239	65	304	
		%			100.0%	

On comparing age distribution with presence of vaginal infections, no significant difference was observed as revealed by the insignificant p value of 0.25. This shows that age of women is not a risk factor for developing vaginal infections.

Table 3A: Socioeconomic status distribution

SES	Frequency	Percent
Lower	237	78.0
Middle	50	16.4
Upper	17	5.6
Total	304	100.0

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Majority of the cases belonged to lower class (78%) whereas 16.4% belonged to middle class and 5.6% belonged to upper class.

Table 3B: Comparing Socioeconomic status with Presence of vaginal infection

			Presence of vaginal infection		Total	P value
			No	yes		
S.E.S.	Lower	Count	179	58	237	0.022
		%	75.6%	24.4%	100.0%	
	Middle	Count	43	7	50	
		%	86%	14.0%	100%	
	Upper	Count	17	0	17	
		%	100%	0.0%	100%	
Total		Count	239	65	304	
					100%	

On comparing socioeconomic status with presence of vaginal infections, a significant difference was observed as revealed by the insignificant p value of 0.022. This showed that cases belonging to lower (24.4%) socioeconomic status had more risk of infection in present study whereas no vaginal infection was found in women belonging to upper class.

Table 4A: Residence distribution

Residence	Frequency	Percent
Rural	280	92.1
Urban	24	7.9
Total	304	100.0

Out of 304 women, majority belonged to rural area (92.1%) whereas 7.9% belonged to urban area.

TABLE 4B- Comparing residence distribution with presence of vaginal infection

			Presence of vaginal infection		Total	P value
			no	yes		
Residence	Rural	Count	221	59	280	0.65
		%	78.9%	21.07%	100%	
	Urban	Count	18	6	24	
		%	75%	25%	100%	
Total		Count	239	65	304	
		%	78.6%	21.3%	100.0%	

In present study, out of 280 women who were from rural area only 21.07% were positive for vaginal infection whereas out of 24 women from urban area 25% were positive for vaginal infection .P value is 0.65 which is insignificant, which shows there is no association between residence and vaginal infection.

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Table 5: Booking status

Booking Status	Frequency	Percent
Booked	106	34.9
Unbooked	198	65.1
Total	304	100.0

Out of 304 cases, majority were unbooked (65.1%) whereas 34.9% were booked cases.

Table 6: Religion distribution

Religion	Frequency	Percent
Hindu	281	92.4
Muslim	23	7.6
Total	304	100.0

Out of 304 cases, majority were Hindu (92.4%) whereas 7.6% were Muslim cases.

Table 7A: Distribution according to BMI

BMI	Frequency	Percent
Underweight	53	17.4
Normal	143	47.0
Overweight	65	21.4
Obese	43	14.1

Distribution according to BMI showed that there were 17.4% womens who were underweight whereas 21.4% were overweight and 14.1% were obese womens.

Table 7 B: Comparing BMI distribution with presence of vaginal infection

			Presence of vaginal infection		Total	P value
			no	Yes		
BMI	Underweight	Count	44	9	53	<0.0001
		%	83.01	16.99	100	
	Normal	Count	127	16	143	
		%	88.81	11.19	100	
	Overweight	Count	30	35	65	
		%	46.15	53.84	100	
	Obese	Count	38	5	43	
		%	88.37	11.63	100	
Total		Count	239	65	304	
		%	78.61	21.39	100	

On comparing BMI with presence of vaginal infection,a significant difference was observed as revealed by the significant p value of <0.0001.Out of 65 overweight cases 53.84% had vaginal infection.

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Table 8A: Distribution according to parity

Parity	Frequency	Percent
Primi	144	47.4
Second gravid	113	37.2
Third gravida or more	47	15.5
Total	304	100.0

In the present study 47.4% women were primi whereas 37.2% were second gravida and 15.5% third gravida or more respectively.

Table 8B: Comparing parity with Presence of vaginal infection

			Presence of vaginal infection		Total	P value
			no	Yes		
Parity	Primi	Count	95	49	144	<0.001
		%	66%	34%	100%	
	Second gravid	Count	104	9	113	
		%	92.1%	7.9%	100%	
	Third gravida or more	Count	40	7	47	
		%	85.1%	14.8%	100%	
Total		Count	239	65	304	
		%			100%	

On comparing with presence of vaginal infections, a significant difference was observed as revealed by the insignificant p value of <0.001. cases who were primi (34%) had more risk of infection whereas cases who were third gravida or more had least vaginal infections.

Table 9: Previous preterm delivery

Previous preterm delivery	Frequency	Percent
No	277	91.1
Yes	27	8.9
Total	304	100.0

Out of 304 cases, 27 (8.9%) had previous preterm delivery.

Table 10: Distribution of cases based on hemoglobin level

Hemoglobin	Frequency	Percent
6-7	24	7.9
8-9	146	48.0
10-12	134	44.1
Total	304	100.0

Distribution of cases based on hemoglobin level showed that majority had hemoglobin level between 8-9 (48%) whereas 44.1% had hemoglobin between 10-12 and 7.9% had between 6-7 in present study.

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Table 11: Comparing different categories of preterm with presence of vaginal infections

			Presence of vaginal infection		Total	P value
			No	yes		
GA group	Extreme preterm	Count	1	0	1	0.666
		%	100%	0.0%	100%	
	Very preterm	Count	22	8	30	
		%	73.3%	26.6%	100%	
	Late preterm	Count	216	57	273	
		%	79.1%	20.8%	100%	
Total		Count	239	65	304	
		%			100%	

On comparing various categories of preterm with presence of vaginal infections, no significant difference observed as revealed by the insignificant p value of 0.666.

Table 12: Distribution according to Bacteriological profile

Bacteriological profile	Frequency	Percent
Candida	38	12.5
Staph	4	1.3
Mix	23	7.5
Sterile	239	78.7
Total	304	100.0

Distribution according to Bacteriological profile showed that 12.5% had candida infection, 1.3% had staphylococcus infection, and 7.5% had mixed infections.

3. DISCUSSION

- **DISRTIBUTION ACCORDING TO STUDY POPULATION(TABLE-1)**

In our institute, in a period of 15 months from 1st jan 2021 to **31st march** 2022..during this period total deliveries were 6346,among them 5428 had normal deliveries and 918 had caserean section,in comparison to the usual figures deliveries were some what less due to covid pandemic.Total 472 cases presented with preterm pain, so incidence of preterm in our institute was 8.7%,among 472 cases 172 were true preterm who got delivered, so the incidence of true preterm was 3.4% and 286 cases were threatened preterm who were conservatively managed, so the incidence of threatened preterm was 5.3%.Among 472 preterm cases,120 cases were excluded while 352 cases included according to inclusion/exclusion criteria, among 352 cases,48 cases were lost in follow up. Total study population were 304 cases. Among 304 cases, 196(64.5%) were managed, continued and delivered at term while 108 cases(35.5%) land up in labour inspite of treatment.

In present study, out of 108 cases of true preterm,41(37.9%) had vaginal infection and 67(62.1%) had no vaginal infection, whereas out of 172 threatened preterm, only 24(12.2%) cases had vaginal infection and 172(87.7%) had no vaginal infection.This study showed positive association between true preterm cases and vaginal infection. Similar to our finding a study done by Hugh C.G. Nadeau et al 2015[15] stated that, genital tract infection is associated with approx 25-45% of preterm birth based on microbiological study, the range may be larger but is limited by methods for detection of infection.

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- **DISTRIBUTION OF THE CASES ACCORDING TO AGE GROUP (TABLE-2)**

We found that the majority of the cases(62.8%) were between 20-25 year age group whereas lowest number of cases(8.2%) were younger than 20 years. The risk of preterm birth was higher among mothers between 20-25 years. Similar study done by *R.I.KHAN et at* 2022[16]- where 52.6% cases were between 18-28 years age group, Several other studies have also reported linking both younger and older maternal age with preterm births.[17,18]However, a study conducted by Shah et al. found women aged <20 years to be protective for preterm birth, similar to our findings.[19] In Our study majority of the cases(81.6%)were from 20-30 year age group.As this is the most common age group of fertility. In the present study, in age group <20 years there was 25 cases, 9(36%) had vaginal infection whereas 16(64%) had no vaginal infection. Age group between 20-25 years, there were 189 cases ,40(21.2%) had vaginal infections whereas 149(78.8%) had no vaginal infection. Age group between 26-30 years, there were 57 cases,11(19.3%)had vaginal infection whereas 46(80.7%)had no vaginal infection, age group >30 years, there were 33 cases,5(15.2%)had vaginal infection, whereas 28(84.8%) had no vaginal infection. In our study we found that in cases below 20 year of age, vaginal infection were slightly more in comparison to other age group. Contrary to this a study conducted by **Nelson M et al**., 2013[20] vaginal candidiasis infection was highest among age group of 26-35 years (60%). Another study done by Disha, T.L et al., 2021, VVC infection was highest among the age group of 25–29 years (68.3%)[21].On comparing age distribution with presence of vaginal infections, no significant difference was observed as revealed by the insignificant p value of 0.25. This shows that age of women is not a risk factor for developing vaginal infections. However in our study we found that vaginal infection is associated with low maternal age, the reason could be that in younger cases there is a lack of knowledge about personal and menstrual hygiene, frequent intercourse without using any contraception can also be one of the reason.

COMPARING SOCIOECONOMIC STATUS WITH PRESENCE OF VAGINAL INFECTION (TABLE3)

In our study out of 304 cases, 237 cases were of lower socioeconomic status, among them 58(24.4%) had vaginal infection and 179(75.6%) had no vaginal infection, whereas among 50 cases of middle socioeconomic status7(14%) had vaginal infection and 43(86%) had no vaginal infection. Among 17 cases who belonged to upper socioeconomic class no vaginal infection has been reported This shows that lower SES of cases is a significant risk factor for developing vaginal infections. **Butler and Alberman 1969[22], Meis et al 1987[23]** , proposed socioeconomic status as an important factor for pre term labour.

- **Peacock, J. L., et al., 1995[24]** found the positive association between lower socioeconomic class and pre term birth.

Our study showed that cases of lower socioeconomic status were more prone for vaginal infection. This could be due poor hygiene, weak immunity due to poor nutrition, unhygienic menstrual practices.

- **DISTRIBUTION OF CASES ACCORDING TO RESIDENCE AND ITS ASSOCIATION WITH VAGINAL INFECTION(TABLE 4A,4B)**

In the present study, out of 304 cases,280(92.1%) were from rural area whereas 24(7.9%) belonged to urban area. Among the 280 cases who were from rural area ,59(21.07%) had vaginal infection and 221(78.9%) had no vaginal infection, whereas out of 24 cases who belonged to urban area,6(25%) had vaginal infection and 18(75%) cases had no vaginal infection. In our study we found that urban population had more vaginal infection than rural population,. In other studies by various authors contradictory findings were observed-

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- **(Durai et al., 2019**)-in women in A population-based study from rural India revealed that almost every fifth rural India had at least anyone symptom of reproductive tract infection (21%) which is very high; of whom the higher percentage of women (80%) had at least any one of the pre-existing conditions such as menstrual disorders, urinary/anal disorders, and anemia.
- (**Durai et al., 2019**)- An Indian study from Hariyana found the prevalence of RTI was higher in rural population (28.7%) than urban population (16.6%)

- **DISTRIBUTION ACCORDING TO BOOKING STATUS (TABLE 5**)
  In the present study, out of 304 cases majority of the cases 106(65.1 %) were unbooked whereas booked cases were 198 (34.9%), However, contrary to present study ,in a study done by **Yarlagadda S et al. 2018**[25] majority were booked cases 56.89%.this study was conducted in Andhrapradesh state where literacy rate is higher.In our institute maximum number of cases come from rural area where medical facility are sheldom and most of the cases are usually unbooked.

- **DISTRIBUTION ACCORDING TO RELIGION (TABLE – 6)**
  In the present study majority of the cases were hindus 92.4 % whereas 7.6% were muslims. A study conducted by Chaitanya Tellapragada, et al. 2016[26] Hindus were 88.7% and Muslims were 3.9%.This is because our region is Hindu predominant.

- **DISTRIBUTION ACCORDING TO MATERNAL BMI AND ITS ASSOCIATION WITH VAGINAL INFECTION(TABLE-7)**

Our study showed that out of 53 cases who were underweight,9(16.99%) had vaginal infection and 44(83.01%) had no vaginal infection, among 143 cases with normal BMI,16(11.1%) had vaginal infection and 127(88.8%) had no vaginal infection. 65 Cases who were overweight,35(53.84%) had vaginal infection and 30(88.37%) had no vaginal infection.43 cases who were obese, only 5(11.63%) had vaginal infection whereas 38(88.37%) had no vaginal infection. In present study, we found the positive association with BMI and vaginal infection. Obese cases are more prone for diabetes which indirectly associated with infection.

- The study done by **Cnattingius et al., 2013**[27] showed increased chances of preterm delivery among obese cases. Maternal obesity is associated with inflammatory up-regulation through increased production of adipokines by adipose tissue and enhanced systemic secretion of proinflammatory cytokines. In pregnancy, visceral fat mass is increased, particularly in obese women, and adipokines from visceral fat are known to increase systemic inflammation. Additional mechanisms that may contribute to preterm delivery in obese women include endothelial dysfunction, insulin resistance, oxidative stress, and lipotoxicity.

- **DISTRIBUTION ACCORDING TO PARITY AND ITS ASSOCIATION WITH VAGINAL INFECTION(TABLE-8)**

Out of 144 primi cases 49(34%) had vaginal infection,95(66%) had no vaginal infection whereas out of 113 second gravida cases only 9(7.9%) had vaginal infection and 104(92.1%) had no vaginal infection. In 47 third gravida or more only 7(14.8%) had vaginal infection and 40 (85.1%) had no vaginal infection.In our study, primi cases (75.4%) had more risk of infection whereas cases who were third gravida or more had least vaginal infections. This may be due to in our study maximum primi cases were from low socioeconomic status, so

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they have poor hygiene, weak immunity due to poor nutrition, unhygienic menstrual practices.

- **Butler and Alberman 1969[22] , Meis et al 1987[23]-** This shows that primi gravida is a significant risk factor for developing vaginal infections.**(Shah et al., 2014)[19]** A cohort study in Bangladesh showed similar findings, they found that first pregnancy was a risk factor for preterm birth (RR: 1.3; 95% CI: 0.9 – 1.9). Multiple gestations—accounting for only 2-3% of infants.
- **DISTRIBUTION OF CASES WITH DIFFERENT CATEGORIES OF PRETERM AND ITS ASSOCIATION WITH VAGINAL INFECTION(TABLE-11)**

While comparing the different categories of preterm with presence of vaginal infection out of 273 cases of late preterm 57(20.8%) had vaginal infection while out of 30 cases of very preterm 8(26.6%) had vaginal infection whereas none of the extreme preterm cases had any vaginal infection,

parallel research by Shah et al. Preterm births account for 22.3% of all live births, broken down as follows: 12.3% late preterm, 7.1% moderate preterm, and 2.9% very preterm.[19]**Eschenbach et al 1984[28]** reported the first case control study suggesting an association between bacterial vaginosis and pre-term delivery. Pregnant women are at increased risk for BV because of hormone changes that happen during pregnancy. Hormones are chemicals made by the body. Bacterial vaginosis in pregnancy increases the risk for premature birth and low birth weight.

- ‘**DISTRIBUTION ACCORDING TO BACTERIOLOGICAL PROFILE (TABLE-12)**

Bacteriological profile showed that out of 304 cases, high vaginal swab is positive for vaginal infection in 65 cases among them 12.5% had candida infection, 1.3% had staphylococcus infection, and 7.5% had mixed infections,whwereas high vaginal swab of 239 cases were sterile, no vaginal infection seen. **(Akinbiyi et al., 2008)[29]**-In our study, in our study prevalence of candida was 12.5% in a comparable research among pregnant women in the United Kingdom as opposed to 36.5% .A study by Yarlagadda et al. found that out of 116 women in preterm labour, vaginal infections were seen in 33.62% women. Candida was the commonest microorganism isolated in HVS cultures.(Yarlagadda et al., 2018)[25]A second study from 2022 by Khan et al. reported that vaginal infections occurred in 28 (36.8%) instances and UTIs occurred in 22 (28.9%) cases. Candida was detected in 35.9% of HVS culture tests.[16]This gap in occurrence may result from poor sanitary conditions in many rural areas. The enormous differences in the prevalence rate between nations are explained by local population dynamics and risk factors for infection. The fact that the research subjects were pregnant may have contributed to the significant Candida spp colonization. Pregnancy has a significant impact in colonisation and infection, even though 20 to 50% of women harbour candida species without exhibiting symptoms. In contrast to non-pregnant women, pregnant women frequently have Candida spp. colonise their vagina.[30]

4. CONCLUSION

- In our study in central India, the vaginal micro flora that was found to be associated with preterm birth and threatened preterm was candida infection followed by staphylococcal infection and mixed infection.

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- This association was significantly high in patient who were primigravida,from low socioeconomic status and of rural area, similarly these micro flora prevalence was also high in anemic and patient with high BMI.
- Preterm birth is significant toll for neonatal health, hence if we take measures to early identify the cases especially with risk factor of preterm birth at around 24-28 weeks with routine per speculum examination, their treatment empirically/evidence based with these causative agents may help in reduction of this entity of preterm birth.

5. REFERENCES

1. WHO, March of Dimes, PMNCH, Save the Children. (2012). Born too soon: the global action report on preterm birth. In: Howson CP, Kinney M V, Lawn JE (eds). World Health Organization: Geneva.
2. Quinn J, Munoz FM, Gonik B, Frau L, Cutland C, Mallett-Moore T, et al. (2016). Preterm birth: case definition & guidelines for data collection, analysis, and presentation of immunisation safety data. Vaccine 34: 6047–6056.
3. Blencowe H, Cousens S, Oestergaard MZ, Chou D, Moller AB, Narwal R, et al. (2012). National, regional, and worldwide estimates of preterm birth rates in the year 2010 with time trends since 1990 for selected countries: a systematic analysis and implications. Lancet 379: 2162–2172.
4. Behrman RE, Butler AS. (2007). Preterm birth: causes, consequences, and prevention. National Academies Press: Washington, D.C.
5. Fraser AM, Brockert JE, Ward RH. (1995). Association of young maternal age with adverse reproductive outcomes. N Engl J Med 332: 1113–1118.
6. Jacobsson B, Ladfors L, Milsom I. (2004). Advanced maternal age and adverse perinatal outcome. Obstet Gynecol 104: 727–733.
7. Schempf AH, Branum AM, Lukacs SL, Schoendorf KC. (2007). Maternal age and parityassociated risks of preterm birth: differences by race/ethnicity. Paediatr Perinat Epidemiol 21: 34–43.
8. Han Z, Mulla S, Beyene J, Liao G, McDonald SD. (2011). Maternal underweight and the risk of preterm birth and low birth weight: a systematic review and meta-analyses. Int J Epidemiol 40: 65–101.
9. Kistka ZAF, Palomar L, Lee KA, Boslaugh SE, Wangler MF, Cole FS, et al. (2007). Racial disparity in the frequency of recurrence of preterm birth. Am J Obstet Gynecol 196: 1–6.
10. Stock S, Norman J. (2010). Preterm and term labour in multiple pregnancies. Semin Fetal Neonatal Med 15: 336–341.
11. Gardella C, Riley DE, Hitti J, Agnew K, Krieger JN, Eschenbach DA. (2004). Identification and sequencing of bacterial rDNAs in culture-negative amniotic fluid from women in premature labor. Am J Perinatol 21: 319–323.
12. Hillier SL, Martius J, Krohn M, Kiviat N, Holmes KK, Eschenbach DA. (1988). A case–control study of chorioamnionic infection and histologic chorioamnionitis in prematurity. N Engl J Med 319: 972–978.
13. Hill GB. (1993). The microbiology of bacterial vaginosis. Am J Obstet Gynecol 169: 450–454.
14. Leitich H, Bodner-Adler B, Brunbauer M, Kaider A, Egarter C, Husslein P. (2003). Bacterial vaginosis as a risk factor for preterm delivery: a meta-analysis. Am J Obstet Gynecol 189: 139– 147.

ISSN: 0975-3583, 0976-2833 VOL14, ISSUE8, 2023

15. Nadeau HC, Subramaniam A, Andrews WW. Infection and preterm birth. InSeminars in Fetal and Neonatal Medicine 2016 Apr 1 (Vol. 21, No. 2, pp. 100-105). WB Saunders.
16. Rakhshinda Inam Khan, Bushra Bashir, Shahnaz Sultan, Hajra Rafique, Asifa Alia, Sanila Gul. Prevalence of Vaginal Infections in Preterm Labour. AL-https://doi.org/10.53350/pjmhs22166990
17. Anderson, C., Smitherman, A.B., Engel, S.M., Nichols, H.B., 2018. Modifiable and non-modifiablise risk factors for preterm delivery among adolescent and young adult cancer survivors. Cancer Causes Control 29,
18. Kildea, S.V., Gao, Y., Rolfe, M., Boyle, J., Tracy, S., Barclay, L.M., 2017. Risk factors for preterm, low birthweight and small for gestational age births among Aboriginal women from remote communities in Northern Australia. Women Birth 30, 398–405.
19. Shah, R., Mullany, L.C., Darmstadt, G.L., Mannan, I., Rahman, S.M., Talukder, R.R., Applegate, J.A., Begum, N., Mitra, D., Arifeen, S.E., 2014. Incidence and risk factors of preterm birth in a rural Bangladeshi cohort. BMC Pediatr. 14, 1–11.
20. Nelson M, Wanjiru W, Margaret MW. Prevalence of vaginal candidiasis and determination of the occurrence of Candida species in pregnant women attending the antenatal clinic of Thika District
21. Disha TL. *Prevalence and Risk factors of Vulvovaginal Candidiasis during pregnancy: A Review* (Doctoral dissertation, Brac University).
22. Butler NR, Alberman ED. Perinatal problems. The Second Report of the 1958, British Perinatal Mortality Survey under the auspices of the National Birthday Trust Fund. Perinatal problems. The Second Report of the 1958, British Perinatal Mortality Survey under the auspices of the National Birthday Trust Fund.. 1969.
23. Meis JM, Alberto G. Ayala, Douglas E. Johnson. Adenocarcinoma of the urethra in women. A clinicopathologic study. First published: 1 September 1987 https://doi.org/10.1002/1097-0142(19870901)60:5<1038::AID-CNCR2820600519>3.0.CO;2-%23
24. Peacock JL, Bland JM, Anderson HR. Preterm delivery: effects of socioeconomic factors, psychological stress, smoking, alcohol, and caffeine. Bmj. 1995 Aug 26;311(7004):531-5.
25. Srilakshmi Yarlagadda*, Sajana G., Prasuna J. L. Narra. Association of vaginal infections in Preterm labour. Available from: https://www.ijrcog.org/index.php/ijrcog/article/view/4939
26. Tellapragada C, Eshwara VK, Bhat P, Acharya S, Kamath A, Bhat S, Rao C, Nayak S, Mukhopadhyay C. Risk factors for preterm birth and low birth weight among pregnant Indian women: a hospital-based prospective study. Journal of Preventive Medicine and Public Health. 2016 May;49(3):165.
27. Cnattingius, S., Villamor, E., Johansson, S., Bonamy, A.-K.E., Persson, M., Wikström, A.-K., Granath, F., 2013. Maternal obesity and risk of preterm delivery. Jama 309, 2362–2370.
28. Eschenbach DA, Gravett MG, Chen KCS, et al. (1984) Bacterial vaginosis during pregnancy: An association with prematurity and postpartum complications. In: Mardh PA, Taylor Robinson D, eds. Bacterial vaginosis. Stockholm: Almqvist and Wiksel, pp 214–218
29. Akinbiyi AA, Watson R, Feyi-Waboso P. Prevalence of Candida albicans and bacterial vaginosis in asymptomatic pregnant women in South Yorkshire, United Kingdom. Archives of gynecology and obstetrics. 2008 Nov;278(5):463-6.

ISSN: 0975-3583, 0976-2833 VOL14, ISSUE8, 2023

30. Leli C, Cenci E, Cardaccia A, Moretti A, D'Alò F, Pagliochini R, Barcaccia M, Farinelli S, Vento S, Bistoni F, Mencacci A. Rapid identification of bacterial and fungal pathogens from positive blood cultures by MALDI-TOF MS. International Journal of Medical Microbiology. 2013 May 1;303(4):205-9