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Original Research Article

To Study Spectrum of Cervical Cytology in Conventional Pap Smear by Bethesda System 2014 at Tertiary Care Centre Bastar C.G.

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Conflict of interest: Nil

Abstract:

Introduction: Cervical cancer is one of the leading causes of morbidity and mortality among women worldwide. Cervical cancer can be preventable by early detection and screening precursor lesions by Papanicolaou smear (PAP) smear.

Aim: The aim of our study is to study spectrum of cervical cytology in conventional PAP smear by applying Bethesda system 2014 at tertiary care center Bastar C.G.

Material and Method: This retrospective study is conducted by Department of Pathology at Lt. Baliram Kashyap Memorial Government Medical College, Jagdalpur for a period of 2 years. A total of 1046 cases included and slides were reported according to Bethesda system 2014.

Result: Out of 1046 cases, maximum number of cases were in age group of 31 – 40 years comprise of 381(36.42%) followed by 32(30.87%) cases in 41-50 years. Highest number of cases 370(35.37%) belong to NILM, followed by ASC-US cases 92 (8.79%) followed by LSIL16 (1.52%) and HSIL, SCC and AGC (NOS) were found to be 08 (0.8%), 04(0.38%) and 04(0.38%) respectively. The remaining cases 16(1.52%) were Unsatisfactory.

Conclusion: Cervical pap smear with Bethesda system 2014 help to categorise lesions as infective, inflammatory and neoplastic and for appropriate treatment by clinician especially in rural area.

Key words: Cervical carcinoma, PAP smear, Bethesda System.

Introduction

Cancer of cervix is a major health issue worldwide. It is the second and fourth most commonly diagnosed cancer in females in India and worldwide respectively [1]. Every year 1,23,907 new cases are added and 77348 deaths occur in India 2.

In last 30 years, the incidence of carcinoma decreases more than 50% after applying cervical screening with pap smear [3]. George Papanicolaou was the first person to introduce PAP test in clinical practice for screening of cervical cancer in 1940[4].

For uniformity in reporting system of cervical cytology 'The Bethesda system was introduced in1988 and it was revised in 2001 and 2014 [5].

Papanicolaou (PAP) smear is a easy, safe, non-invasive, effective and low-cost screening method for the detection of cervical cancer and precancerous lesions [6].The major risk factors for cervical carcinoma are low socioeconomic status, early sexual activity, multiple sexual partner and human papilloma virus (HPV) infection.[7]

Material and Methods

This retrospective study was conducted between January 2022 to December 2024 for duration of 2 years by Department of Pathology at Lt. Baliram Kashyap Memorial Government Medical College Jagdalpur.

All the data regarding patient's clinical details and slides were retrieved from register in cytology section. All the Pap smear obtained were of conventional method and stained by Pap stain. The cytological reporting was done by two experienced

pathologists according to 2014 Bethesda system for reporting cervical cytology [5]. 2014 Bethesda system for reporting cervical cytology broadly categorised as Negative for intraepithelial lesion (NILM) and epithelial cell abnormality including squamous cell and glandular cell abnormality.

Sample size: A total of 1046 cases included in this retrospective study.

Inclusion Criteria: All female patients between 20-80 years were included.

Exclusion Criteria: Smears from Vaginal vault smears were excluded.

Statistical analysis: Data were analysed using Microsoft Excel and percentage was calculated.

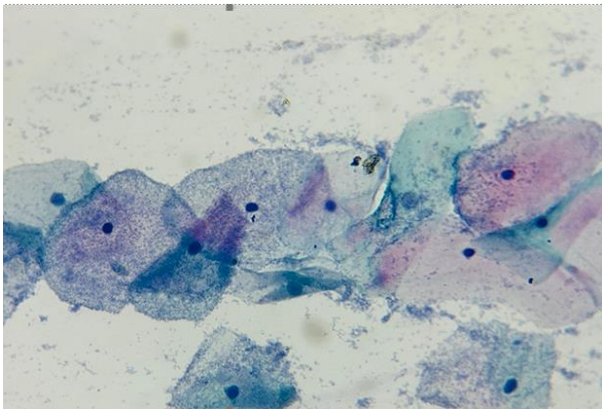

Figure 1: Bacterial Vaginosis show clue cells and Cocco bacilli (PAP 40X)

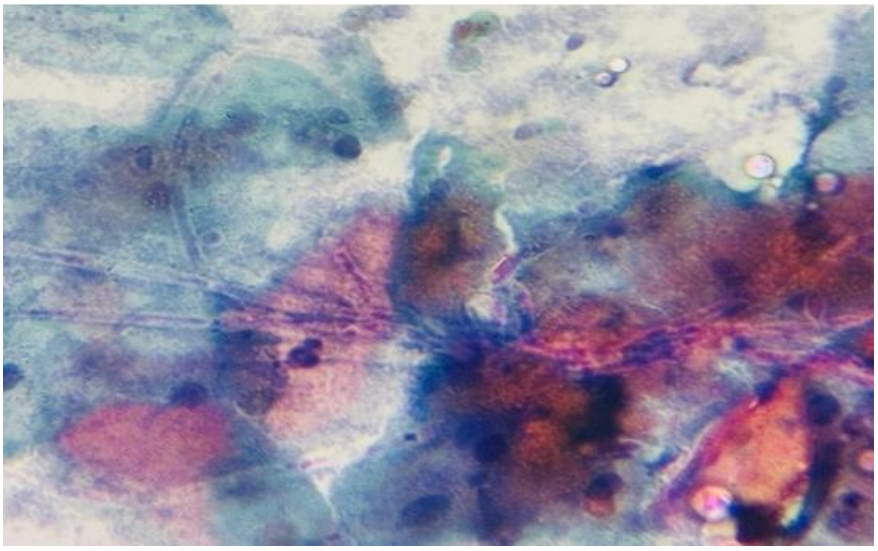

Figure 2: Candidasis (40X) show Pseudohyphae and fungal spores

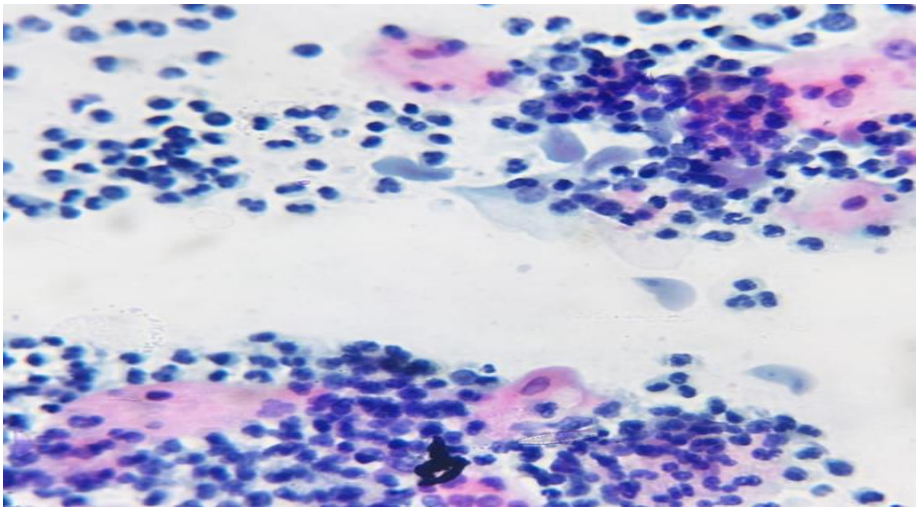

Figure 3: Trichomonas Vaginalis (40X)

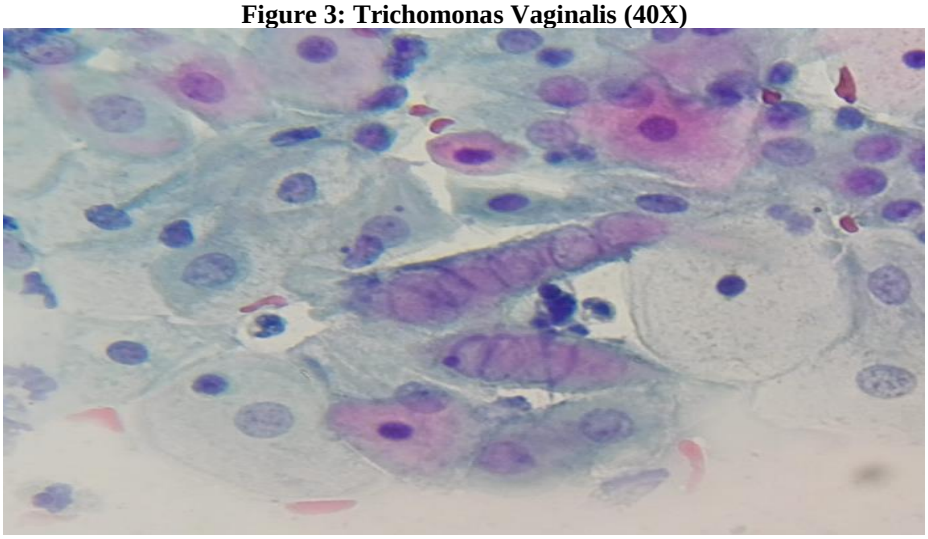

Figure 4: Herpes simplex (40X)

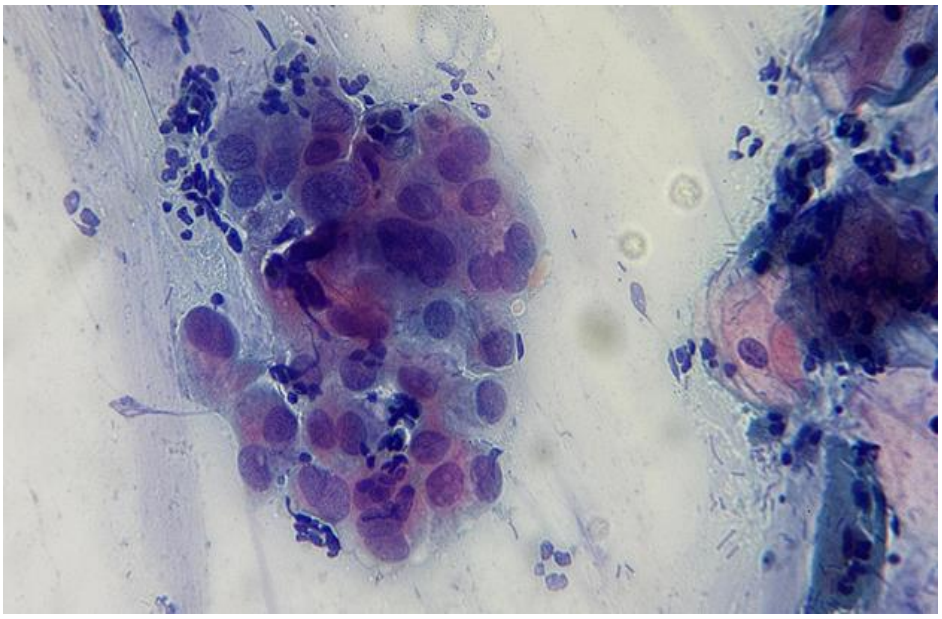

Figure 5: ASCUS-US (40X)

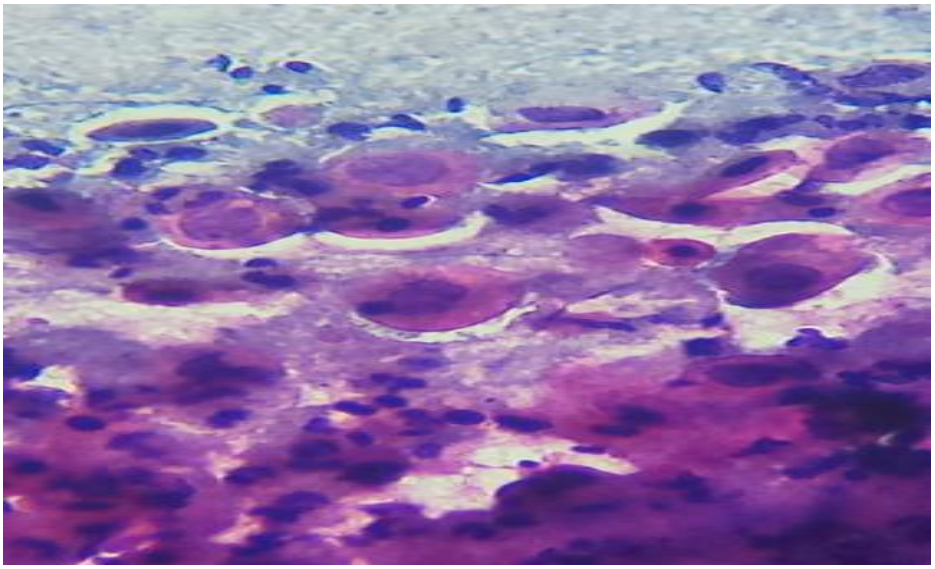

Figure 6: ASCUS-H (40X)

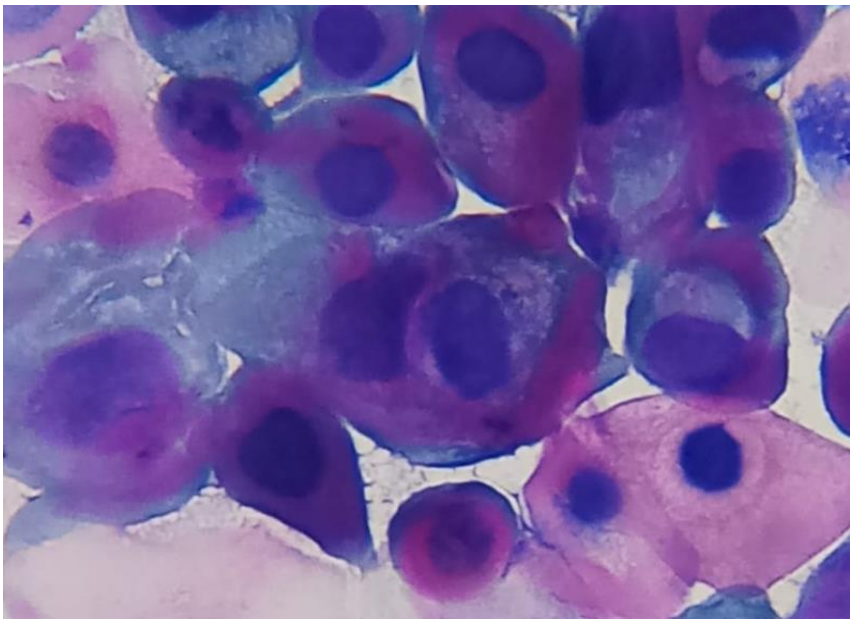

Figure 7: LSIL (40X)

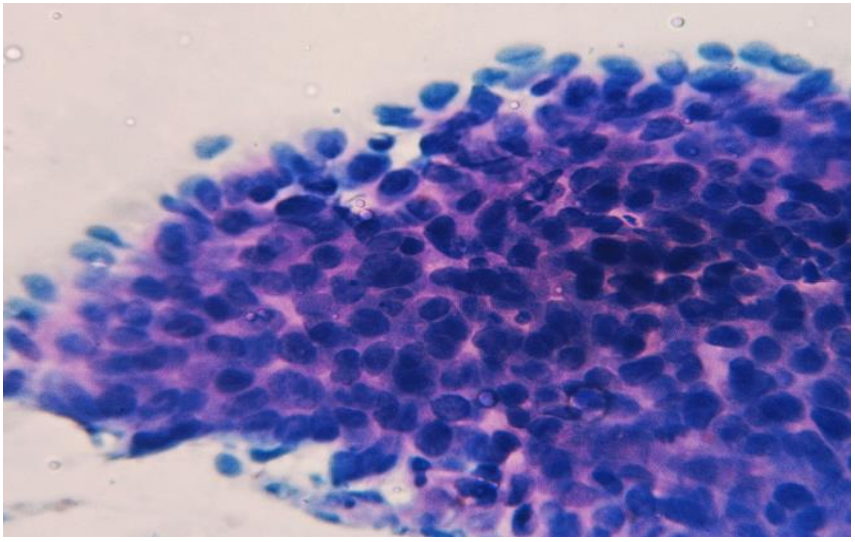

Figure 8: HSIL (40X)

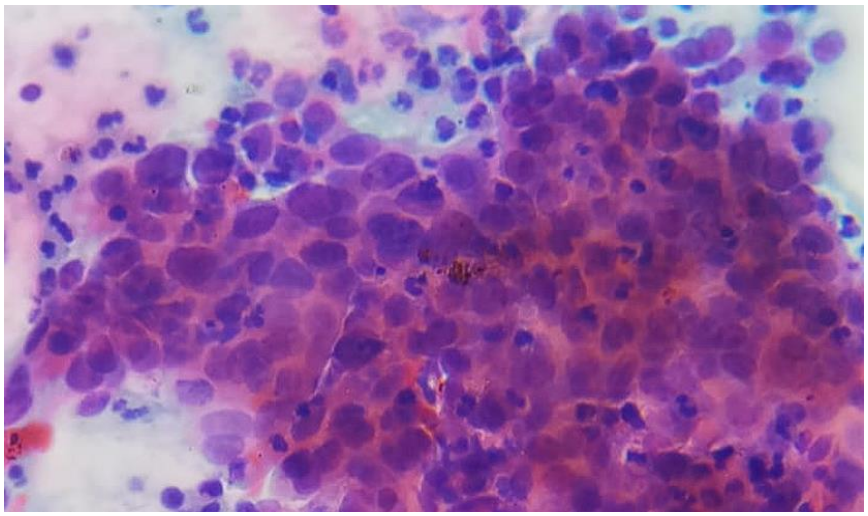

Figure 9: Squamous cell carcinoma (40 X)

Result and Observation

Table 1: Distribution of cases according to age

Age group	No. of cases	Percentage (%)
20-30yrs	205	19.59
31-40yrs	381	36.42
41-50yrs	323	30.87
51-60yrs	94	8.98
61-70yrs	35	3.34
71-80yrs	08	0.76
Total	1046	100

Table 2: Distribution of cases according to Bethesda category

Category	Subcategory	Number of cases	percentages
Unsatisfactory	-	32	3.05%
NILM	Only NILM	370	35.4%
	Inflammatory	226	21.06%
	RCC due to Inflammation	92	8.79%
	Atrophic vaginitis	06	0.57%
	Bacterial Vaginosis	88	8.41%
	Candidiasis	74	7.07%
	Trichomonas Vaginalis	20	1.91%
	Herpes simplex	02	0.19%
Squamous cell abnormality	ASC-US	92	8.79%
	ASC-H	12	1.14%
	LSIL	16	1.52%
	HSIL	08	0.8%
	SCC	02	0.38%
Glandular abnormality	AGC (NOS)	04	0.38%
TOTAL		1046	100%

Table 3: Distribution of cases according to category and age

Category	Subcategory	Age in Years						Total
		20-30yrs	31-40yrs	41-50yrs	51-60yrs	61-70yrs	71-80yrs	
Unsatisfactory		06(0.57%)	08(0.76%)	08(0.76%)	05(0.47%)	05(0.47%)	00(0%)	32 (3.06%)
NILM	Only NILM	40(3.82%)	144(13.76%)	132(12.61%)	40(3.82%)	10(0.95%)	04(0.38%)	370 (35.4%)
	Inflammatory	60(5.73%)	108(10.32%)	40(3.82%)	08(0.76%)	08(0.76%)	02(0.19%)	226 (21.60%)
	RCC due to Inflammation	20(1.91%)	28(2.67%)	36(34.44%)	06(0.57%)	02(0.19%)	00(0%)	92(8.79%)
	Atrophic vaginitis	02(0.19%)	00(0%)	00(0%)	00(0%)	02(0.19%)	02 (0.19%)	06(0.57%)
	Bacterial Vaginosis	24(2.29%)	28(2.67%)	28(2.67%)	08(0,76%)	00(0%)	00(0%)	88(8.41%)

	Candidiasis	28(2.67%)	18(1.72%)	28(2.67%)	00(0%)	00(0%)	00(0%)	74(7.07%)
	Trichomonas Vaginalis	08(0.76%)	06(0.57%)	06(0.57%)	00(0%)	00(0%)	00(0%)	20(1.91%)
	Herpes simplex	01(0.09%)	01(0.09%)	00(0%)	00(0%)	00(0%)	00(0%)	02(0.19%)
Squamous cell abnormality	ASC-US	12(1.14%)	24(2.29%)	30(2.86%)	22(2.10%)	04(0.38%)	00(0%)	92(8.79%)
	ASC-H	00(0%)	06(0.57%)	06(0.57%)	00(0%)	00(0%)	00(0%)	12(1.14%)
	LSIL	04(0.38%)	06(0.57%)	O6(0.57%)	00(0%)	00(0%)	00(%)	16(1.52%)
	HSIL	00(0%)	02(0.19%)	02(0.19%)	02(0.19%)	02(0.19%)	00(0%)	08(0.8%)
	SCC	00(0%)	00(0%)	00(0%)	02(0.19%)	02(0.19%)	000(%)	04(0.38%)
Glandular abnormality	AGC (NOS)	00(0%)	02(0.19%)	01(0.09%)	01(0.09%)	00(0%)	00(0%)	04(0.38%)
TOTAL		205(19.59%)	381(36.42%)	323(30.9%)	94(8.98%)	35(3.34%)	08(o.76%)	1046(100%)

Table 4: Comparative study of epithelial abnormality in the present study with other study.

Author	No Of Cases	ASC-US (%)	ASC-H (%)	LSIL (%)	HSIL (%)	SCC (%)
Nair et al [8]	2028	0.15	-	1.58	0.49	0.20
Sharma et al [9]	450	3.3	-	1.2	0.4	0.2
Sachan et al [10]	1650	2.9	-	5.09	0.48	0
Vedavati et al [11]	200	4	-	3.5	1	0
Jadhav et al [12]	487	0.20	-	0.20	0.41	0.41
Shaki et al [13]	1100	4	1	6.8	6	26
Subhadarshini et al [14]	800	1.7	-	1.8	1.7	0.25
Patil et al [4]	490	5.3	0.61	1.03	0.8	0.2
Present study	1046	8.7	1.14	1.52	0.8	0.38

A total of 1046 cases were studied between age of 20 – 80 years. Youngest case was 20 years and oldest was 80 years.

Table No. 1 show majority of cases 381(36.42%) were in the age group of 31 – 40 years followed by 32(30.87%) cases in 41-50 years while least number of cases 04(0.38%) were between 71-80 years.

Table No. 2 shows distribution of cases according to 2014 Bethesda system where maximum number of cases 370 (35.4%) seen in only NILM followed by 226 cases (21.0%) in Inflammatory group. In NILM category, the maximum number of cases 144(13.76%) belong to 31-40 years. In inflammatory smear, highest number of cases 108 (10.32%) belong to 31-40 years. Among infections, Bacterial vaginosis has highest number of cases 88(8.41%) followed by Candidiasis with 74 cases (7.70%) Trichomonas Vaginalis 20(1.91%) cases with lowest number of cases 02 (0.19%) in Herpes simplex.

In this study epithelial abnormalities are Atypical squamous cell of undetermined significance) (ASC-US), Atypical squamous cell of undetermined significance cannot exclude high grade intraepithelial lesion (ASC-H), Low grade intraepithelial lesion (LSIL), High grade intraepithelial lesion (HSIL), Squamous cell carcinoma (SCC).glandular abnormality and AGC (NOS) were found to be 92 (8.79%) ,12 9(1.14%), 16(1.52%), 08 (0.8%), 04(0.38%) and 04(0.38%) respectively.

Table No. 3 show most frequent epithelial abnormality is ASC-US cases 92 (8.79%) followed by LSIL 16(1.52%) cases. Highest number 30(2.86%) cases seen in ASC-US belong to 41-50 years. In LSIL 02(0.19) cases equally affect the age group 31-40 years and 41-50 years. The cases 04(0.38%) of SCC belong to 51-60 years and 61-70 years.

Discussion

Cervical cancer is the most preventable cancer in India after carcinoma of Breast [15]. In India, death due to cervical cancer constitute 10% and it is the third largest causes of cancer mortality [5]

Cervical Precancerous lesions progress to cancer within 10-15 years that provide time for screening of cancer for early detection.[16]

For early detection of precancerous lesion and cervical cancer, Pap smear is the most effective screening method. [10]. American Cancer society 2012 recommended the PAP smear every 3 years and Pap smear with HPV DNA test in every 5 years as screening method [4]. Application of Bethesda system 2014 for reporting cervical cytology in pap smear help in screening precursor lesion and give direction for the management of the patient for clinician.[17]

In our study, maximum cases 381(36.42%) were in age group of of 31-40 years and similar findings are seen in Patil et al [4]. The age range in our study was 20 to 80 years with a mean age of 39.24

For reporting PAP smear adequate smear is mandatory. In the present study Unsatisfactory smear was 32(3.05%) which was similar to study done by with Pandey et al 74(3.47%) [18] While Patil et al [4] show higher incidence 8.5%. In our study most common reason for unsatisfactory smear is due to low squamous cell cellularity and obscuring of cellular morphology by blood and inflammation.

The present study shows maximum cases 370 (35.37%) in NILM without inflammation and

NILM with inflammation 226 (21.10%) which findings are similar to Patil et al [4]. The incidence of Bacterial Vaginosis, Candida, Trichomonas Vaginalis and Herpes Simplex were 88 (8.84%), 74(7.07%), 20(1.91%) and 02 (%) respectively. However, Garg et al [19] also show similar findings were 4.85%, 8.48% and 5.45% respectively. In this study we noted ASC-US, ASC-H , LSIL , HSIL , SCC and AGC(NOS)S were found to be 92(8.79%) , 12(1.14%), 16(1.52%) , 08(0.79%) , 04(0.38%) and04(0.38%) respectively.All the findings are concordance with findings of Nair et al [8]and Patil et al [4]except ASC-US which is quite high in our study. Saki at al study noted ASC-US, ASC-H, LSIL, HSIL, SCC were found to be 4%, 1, 6.8%, 6%, 26% respectively and the findings are quite different and higher incidence compare to our study. This variation may be due to social, cultural diversity, marriage at different ages and lack of awareness.

Our study carried out at Bastar region which is the most remote and tribal area of Chhattisgarh where people of Bastar believe and rely more on indigenous medicine rather than Morden medicine. So, they do not visit hospital for investigation and treatment. The draw back in our study are difficulty in follow up especially in ASC-US and represent small population.

Conclusion

Pap smear is a simple, economical, rapid and safe, procedure for screening infectious, inflammatory, precancerous lesion and carcinoma cervix. Pap smear with Bethesda system 2014 for reporting cervical cytology is a standardized reporting system provide uniformity in reporting among pathologist and help in management for clinician. So, it should be implemented in all institution as routine screening. There is also need for organization of cervical cancer screening program through health camp, educational intervention by local government especially in Bastar region for public awareness of cervical cancer.

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