"A STUDY TO DETECT PREINVASIVE AND INVASIVE CANCER OF THE CERVIX DURING PREGNANCY BY USING PAP SMEAR"

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Dr. KURRA SAI PUJITHA

LIST OF ABBREVATIONS USED

PAP	Papanicolau
HIV	Human Immunodeficiency Virus
OPD	Out Patient Department
ACOG	American College Of Obstetricians and Gynaecologists
HPV	Human Papilloma Virus
CIN	Cervical Intraepithelial Neoplasia
SIL	Squamous Intraepithelial Lesion
LSIL	Low-grade Squamous Intraepithelial lesions
HSIL	High-grade Squamous Intraepithelial lesions
ASC-US	Atypical Squamous Cells of Undetermined Significance
LGSIL	Low-grade Squamous Intraepithelial Neoplasia
DNA	Deoxyribonucleic Acid
RBC	Red Blood Corpuscles
USFDA	Food and Drug Administration
ASC-H	Atypical Squamous Cells cannot exclude HSIL
NCI	National Cancer Institute
IUD	Intrauterine Contraceptive Device
AIS	Adenocarcinoma in situ
NOS	Not otherwise specified
ANC	Antenatal case
HBsAg	Hepatitis B Virus surface Antigen
OCP	Oral contraceptive pills
STI's	Sexually Transmitted Infections
VDRL	Venereal Disease Research Laboratory
AGC	Atypical Glandular Cells
POG	Period of gestation
NILM	Negative for intraepithelial lesion or malignancy
LBC	Liquid based cytology

VIA	Visual inspection with acetic acid
VIAM	Visual inspection with acetic acid and magnification
VILI	Visual inspection with Lugol's iodine
LEEP	Loop electrosurgical excision procedure
SCC	Squamous cell carcinoma
NCCP	National Cancer Control Programme
Primi	Primigravida
Multi	Multigravida

ABSTRACT

"A STUDY TO DETECT PREINVASIVE AND INVASIVE CANCER OF THE CERVIX DURING PREGNANCY BY USING PAP SMEAR"

Background and objectives:

Cervical cancer is the 2nd leading cause of female cancer deaths in india. The Papanicolau (PAP) smear is the most successful screening test for carcinoma, since its introduction the national death from cervical cancer has dropped by 70%. In rural India, pregnancy and a request for antenatal care may be the only reason for a woman to consult a health professional. This study aimed to screen pregnant women for pre invasive lesions of cervix using PAP smear, to know the prevalence of cervical lesions during pregnancy in rural population of kolar ,to sensitize and create awareness towards prevention of carcinoma cervix, establish a routine, and contribute to the national screening programme.

Methods:

In this study, 137 antenatal cases were taken from OPD of department of obstetrics and gynecology of R.L Jalappa Hospital and Research center, constituent of Sri Devaraj Urs Medical College, Tamaka, Kolar. All Antenatal women of 14 weeks to 40 weeks of gestational age were included. Antenatal women who have been previously diagnosed with cervical pathology, with unexplained vaginal bleeding, in established labor, with premature rupture of membranes, having history of recent coitus or using any vaginal medications were excluded.

Results:

Among 137 patients studied, mean age under the study was 24.17years; most of them were in their third trimester. 16.05% cases are younger than 20years of age and large proportion of 32.11% was between 21-23 years of age. Most of the subjects (75.9%) were married above 18years and 48.2% were primipara, 56.2% belongs to low socioeconomic status, 45.3% were

uneducated and only 32.1% were aware of Pap smear. None of the Pap smears reported any intraepithelial lesion.

Interpretation and Conclusion:

Even though most of the women had strong risk factors like low socioeconomic status, uneducated, early marriages, none of the women showed abnormal smears in this study, could be due to most of the subjects were married above 18 years of age delaying their sexual debut, and majority of the cases were nullipara or primipara. All women age 18 and older (younger, if sexually active) need to have regular Pap smear screenings. Women who screened for cervical cancer during an initial visit, using a Pap smear and if the test finds something abnormal, they must come again for a more detailed assessment. If this assessment reveals a precancerous condition or the early stages of cancer, they must make third visit for treatment. Progression of low grade dysplasia to carcinoma during pregnancy is unusual and no patient in this study was found to have invasive cancer and hence repeated smears are necessary.

Key words:

Pap, CIN, Carcinoma cervix

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INTRODUCTION

Exfoliative cytology is the study of cells shed from the membranes of various organs. The exfoliated cell, when collected and appropriately stained gives information on the state of lining epithelium of the organ from which it has been derived. There are characteristic cellular and nuclear changes in the cells derived from the normal epithelium. Those differ distinctly from those derived from the inflamed or malignant tissue. This offers the basic for Papanicolaou testing.

Carcinoma cervix is the most common genital tract cancer encountered in developing countries accounting for 80% of world cases, 18% are from India.

Every year in India, 122,844 women are diagnosed with cervical cancer and 67,477 die from the disease. India has a population of 432.2million women aged 15years and older who are at a risk of developing cancer. [1,2]

Incidence rates vary from 0.1 to 12 per 10,000 pregnancies[3].

Cervical cancer is the most common malignancy diagnosed during pregnancy comprising about 70%.

Risk factors for cervical cancers include [4]:

1. Women with low socio-economic status
2. Sexually active at a younger age
3. Multiple sexual partners
4. Poor genital hygiene
5. Malnutrition
6. Use of oral contraceptives

Cervical cancer screening programmes implemented in developed countries over the past fifty years have significantly contributed to the reduction of cancer cervix related deaths. However, high incidence and mortality rates continue in developing countries due to the lack of screening programmes.[5]

The Pap test has been successful in reducing the incidence of cervical carcinoma by 79% and mortality by 70%.[5]

Pap test's main benefit is the early detection of pre neoplastic lesions. Sensitivity of Pap smear is 84.20% and specificity is 62.10% [6.]

Pap test detects 60-70% of cancer cervix and 70% of endometrial cancer. The Papanicolau (PAP) smear is the most successful screening test for carcinoma, since its introduction the national death from cervical cancer has dropped by 70% [7].

The accuracy of Pap smear in pregnancy is almost similar to that of non-pregnant women.

Many patients present with advanced disease during initial visit to the hospitals, due to lack of well-established screening programmes.

In rural India, pregnancy and a request for antenatal care may be the only reason for a woman to consult a health professional. Most cervical abnormalities in pregnancy are discovered as a result of routine screening at the initiation of prenatal care.

Hence screening by Pap smear during pregnancy useful to screen more number of women in reproductive age group, offers unique and efficient way to detect early cervical changes and hence take timely action.

Even though PAP smear and its efficacy as a screening aid for cervical cancer has been extensively studied over decades, studies which are done during pregnancy are not many.

This study is designed as a descriptive study to investigate results of PAP smear screening conducted on pregnant women, to sensitize and create awareness towards prevention of carcinoma cervix, establish a routine, and contribute to the national screening programme.

AIMS AND OBJECTIVES

1. To screen pregnant women for pre invasive lesions of cervix using PAP smear.
2. To know the prevalence of cervical lesions during pregnancy in rural population of Kolar.

REVIEW OF LITERATURE

HISTORICAL BACKGROUND OF CYTOLOGY:

The development of "cytology" as a field of study in medicine required two basic and somewhat obvious pre-existing conditions. First, scholars have to discover that there was such a thing as a cell and that cells of various types made up the bodies of all plants and animals. Second, it has to be able to see those cells with some instrument- the microscope. The first microscope was discovered in the late 16^{th} century, it took another 200 years before the concept of the cell had gained a degree of acceptance. Thus, cytology as a diagnostic tool has only come of age in the last century.

Marie Francios Bichat was the most productive of all the investigators who tried to correlate clinical with pathological research. He introduced the term tissue.

In 1850, Gottlieb Gluge published his Atlas der Pathologischen Anatomie, in which he describe cancer cells in more depth than any one had previously. What he said about the appearance of cancer cells can still be applied today. In cancer, the cells present peculiarities. The characteristic cancer cells are spherical, ovoid, irregularly polyhedral and frequently exhibit caudate prolongations. They possess finely granular contents, with a round or oval nucleus as a large or larger than a pus corpuscle.

The most influential person in the development of modern clinical cytology was George Papanicolaou. He was born in 1883 in Greece, and attended medical school in Athens. He pursued Ph.D. at the university of Munich and returned to Greece, there he found the atmosphere unfavorable for biological research and in1913, he migrated to America. Papanicolaou worked as physiologist for several years at Cornell University Medical College and in 1917 published his famous paper, "The Existence of a Typical Oestrous Cycle in Guinea Pigs with Study of its Histological and Physiological changes, " with Charles Stockard in the American Journal of Anatomy, this research was the basis for his life work. In all, Dr. Pap, as his students called him, spent 45 years devoted to the development of exfoliative cytology as we known it today. He was especially interested in correlating the cyclical changes he discovered in the vagina of guinea pig with those in humans.

New methods to obtain specimens for cytological examination were developed in early 19th century. Joseph Recamier invented the vaginal speculum to obtain cells from the vagina and cervix.

In 1923, at the meeting in New York, Papanicolaou proposed the use of vaginal smears to diagnose uterine cancer.

The pathologist James Ewing, famous for this test Neoplastic Diseases published in 1919, asked skeptically if Papanicolaou could distinguish between endometrial and cervical carcinoma with a cytological examination. When Papanicolaou replied that he could not, Ewing announced to the audience that the proposed diagnostic method was useless, since it was so easy to perform a definitive biopsy. Nevertheless, Papanicolaou continued to study the technique and perform vaginal and cervical smears.

In 1942, he published the technique for staining which he had developed in his Cornell laboratory; it came to be known as Papanicolaou stain.

In 1954, Papanicolaou published his Atlas of Exfoliative Cytology, and his peers immediately accepted the monumental work. His persistence and determination to make the Pap smear and cytology a common clinical tool has resulted in a 70% decrease in death due to cervical and uterine cancer over the last 40 years.

Bosch FX, the most important risk factor for development of cervical cancer is persistent human papilloma virus (HPV) infection. It is the commonest sexually transmitted viral infection and 90% infections become undetectable within 1-2 year.[8]
Goldie SJ, persistent infection with high risk HPV genotypes (16,18) is implicated for the causation of the disease, and for the carcinogenesis HPV infection has to be persistence then its progression to pre-cancerous lesions.[9]

In addition certain cofactors increase the risk of developing cervical cancer such as early onset of sexual activity (<18 years), multiparty, multiple sexual partners, sexually transmitted infections (e.g. chlamydia, genital herpes, HIV), tobacco usage, having a partner

whose former partner had cervical cancer, suppressed immune function (HIV, chemotherapeutic or steroid medications/ history of organ transplant), intrauterine exposure to diethylstilbestrol, long term use (5 or more years) of birth control pills, dietary deficiencies (vitamin A, folate, beta-carotene, selenium, vitamin E, vitamin C) and low socioeconomic status due to non availability of health care services. Women without known risk factors rarely develop cervical cancer.[10]

Based on the above background the most evidence based, effective operationally feasible and culturally appropriate strategies for prevention of cervical cancer in India are

PRIMARY PREVENTION: It includes

- National development
- Health education
- Healthy lifestyle
- Avoiding high risk sexual behavior
- HPV vaccination

SECONDARY PREVENTION: It includes

METHODS OF SCREENING:

- **Cervical cytology:**

1. Conventional
2. Liquid based cytology (LBC)
3. Automated Pap smear

- **Visual inspection of cervix:**

Unaided (Direct visual inspection of cervix, DVI)- Downstaging Aided

1. Visual inspection using 3-5% acetic acid (VIA)
2. Visual inspection using 3-5% acetic acid and magnification (VIAM)
3. Visual inspection using Lugol's iodine (VILI)
4. Speculoscopy

- **HPV Testing**
- **Polar probes**

- **Colposcopy, cervicography and microcolpohysteroscopy** can be used for evaluation of abnormal results.

TERTIARY PREVENTION

Precancerous lesions of cervix can be treated by cryotherapy or loop electrosurgical excision procedure (LEEP).

World wide cervical cancer has accounted for estimated 5,28,000 new cases and 2,66,000 deaths in 2012. Incidence and mortality rates vary between countries, the highest being recorded in the developing countries.

Parkin DM, Pisani P, Ferlay J, about 3,50,000 new cases are identified in developing countries each year, where no organized screening programmes are established and fewer than 1,00,000 in developed countries, where secondary prevention efforts are well established.[11]

Incidence of cervical cancer is much higher in women in developing countries where resources are limited for health care and screening programmes are not implemented. Incidence in India varies from 20-35 per 1,00,000 1women between the ages of 35 years and 64 years. In developed countries the incidence is as low as 1-8 per 1,00,000 women.

Women who are infected with HPV genital subtypes are associated with increased risk of malignant transformation. With wide spread use of Pap smears which helps in early detection of pre-invasive cervical cancer lesions at an early stage, the incidence of cervical cancer has dramatically decreased from 32 cases per 1,00,000 women in 1940's to 8.3 cases per 1,00,00 women in 1980's.

The HPV test is often done at the same time and sometimes in combination with the Pap test. Infection with HPV is the most important risk factor for the development of cervical cancer in women over the age 30. The types of HPV that are most likely to cause cervical cancer can be identified by the presence of DNA in cervical cells. The HPV test may also be used for any woman with abnormal Pap test results to determine the need for additional testing for treatment.

Most common type of cancer is squamous cell carcinoma, which is responsible for nearly 80% cases of cancer and it develops from the cells of ectocervix. Next common type of cancer is adenocarcinoma, which develops from glandular cells in the endocervical canal. The tragedy is worse as cases are detected late when they are incurable and results in very high mortality and this can be avoided by early detection.

Screening for the cervical cancer is the only solution and it needs to be implemented as a public health measure.

Screening is a new concept introduced in 20^{th} century and comes under secondary prevention. Implementation of appropriate screening method for detection of early disease is especially helpful in cervical cancer as there is a well defined natural course, long detectable pre-malignant stage, effective treatment modalities to eradicate premalignant lesions and early cervical cancer, easy accessibility of cervix for screening and acceptance of screening tests. Optimal screening method should identify precursors likely to progress to cervical cancer and avoid detection of transient HPV infection and benign lesions.

Screening is defined as presumptive identification of unrecognized disease by application of diagnostic procedures, which are reliable, safe and rapidly applied. It includes mass, selective, multi-phasic and opportunistic screening.

WHO has laid down certain criteria for any screening program and it includes:

1. The disease should be an important public health program.
2. Biological behavior of the disease should be clearly and adequately understood.
3. The disease should be present in latent or early symptomatic stage where suitable
4. Screening test or examination is available.
5. Screening should be acceptable to the population.
6. Facilities for early diagnosis and treatment should exist.
7. An agreed healthy policy should be present on whom to screen.
8. Cost of diagnosis and treatment should be economically balanced.
9. Diagnosis and treatment should be a continuing process and not a once for all projects.

Accuracy of any diagnostic test is assessed by its sensitivity and specificity. Sensitivity indicates proportion of true cases and true negatives indicate specificity.

Cytology is best established screening method with
Sensitivity: 44 – 78%
Specificity: 91 – 96%

The low sensitivity may be due to sampling or laboratory errors (screening or interpretative error).

Countries with well organized screening programmes using Pap smears have succeeded in preventing 80% of cervical cancer.

India does not have organized screening programmes, only opportunistic, out patient or hospital based programmes. As Pap smear has only moderate sensitivity for CIN 2 & CIN 3, repeated screening at regular intervals is recommended. Shorter the interval since last negative smear, greater is the protection against invasive cancer. As this is not possible in low resource settings like India, with lack of organized screening and delays between screening, test results and treatment, so alternative methods as VIA & HPV testing are being recommended.

Women in India face constraints not only in obtaining health services, but also in expressing reproductive health needs. Lack of awareness, cultural barriers and economic factors prevent them from seeking timely care and women from lower socio-economic strata of the society generally neglect their health needs.

This study was conducted keeping in mind the attitude of Indian women regarding their health check up. But, they do turn up for antenatal check up for ensuring a normal pregnancy with delivery of a healthy baby. This is the opportunity that can be best made use of, in the best interest of such women and all pregnant women should be screened for precancerous lesions. As such during pregnancy, the transformation zone is better exposed due to physiological eversion of cervix (also known as pregnancy ectopy) and cervical sampling becomes easier.

Table A: Estimated costs of different strategies for Cervical screening in India

Strategy	Cost/Yr	% of Annual Health Budget	% Cancers Prevented	Cytotechnician Needs
35-64 yrs. At 5 yr. interval	Rs.355 million	5.2-6.5%	-	-
35-64 yrs. At 10 yr. interval	Rs. 188 million	2.7%	50%	2200
Once/lifetime	Rs.84.79 million	1.2%	20%	824

It is difficult to screen women between ages of 35-64 years at 10 year interval with the present resources.

NCCP Ministry of health and family welfare, govt. of India, Pap smear testing units have been established under the post partum programme in some selected medical colleges. Analysis of the data from these shows that the large numbers of women visiting the post partum units are young & less than 30 years of age. [12]

The Pap smear test is the only screening test for cancer in the world, which has caused a decrease in occurrence and death from cancer. A Pap smear is a screening tool, not a diagnostic test, further evaluation is required when abnormal changes are detected. PAP smear is one of the cervical screening methods which is convenient, economical, painless, sensitive and widely accepted.[6]

Cervical dysplasia and cancer are strongly associated with infection from the human papillomavirus (HPV). Oncogenic HPV types 16 &18 account for nearly 70% of invasive cervical cancers in the US and are more frequently isolated from in cervical cancer tissue than either intermediate (31,33,35,39,45,51,52,58) or low risk types (6,11,42,43,44), with type 16 accounting for approximately 50% cases. However, not all infections with HPV types 16 or 18 progress to cervical cancer. In general, HPV infections in pregnancy that cause cervical dysplasia do not seem to be more aggressive despite the presumed immunosuppressed state.

Studies have proved that cervical cytology conducted during pregnancy is as reliable as those conducted when the individual is not pregnant.[13,47]

PAP smear have not been associated with increased rates of miscarriage or preterm labour.[14]

PAP TEST:

A method for the early detection of cancer especially of the uterine cervix that involves the staining of exfoliated cells using a special technique, which differentiates diseased tissue – called also Papanicolaou smear.

Patient is placed in dorsal position, with labia parted, and the Cusco's self retaining speculum is gently introduced without the use of lubricant or jelly. The cervix is exposed; squamocolumnar junction (where the outer squamous cervical cells meet the inner glandular endocervical cells) is now scraped with Ayres's spatula by rotating the spatula all round (360^0). The collected cells are examined under a microscope to look for abnormalities.

WHO SHOULD HAVE PAP TESTS

Women should seek expert medical advice about when they should begin screening, how often they should be screened, and when they can discontinue cervical screenings, especially if they are at higher than average risk of cervical cancer due to factors, such as HIV infection.

According to the American College Of Obstetricians and Gynaecologists (ACOG), general guidelines include (2016):

- Cervical cancer screening should begin at age 21 for all women, including those who are not sexually active.
- Cervical cancer is very rare in women younger than 21, because the immune system of adolescent woman naturally fights the virus that causes cervical cell changes. The college found that early Pap testing can lead to unnecessary procedures to remove suspicious cells before the woman's body can heal itself. These procedures increase the risk of having premature babies.

- Most women younger than can now be tested for cervical cancer every alternate year instead of annually. Women aged between 21-29 years can be tested once in every three years if they have had consecutive pap tests with normal results.
- Women aged between 30-65years should have Pap test along with HPV DNA co-testing once in every 5 years or Pap test alone once in every 3 years.
- Women at higher risk for cervical cancer may need more frequent screenings. This includes those who have weak immune system or who have been treated for abnormal cervical cells in the past.
- Women aged 65 years of age or older, who have had at least three normal Pap test in a row, are sexually inactive, and had no abnormal Pap tests in the past, on consultation with their health provider, can stop cervical cancer screening.
- Women who are vaccinated against HPV, who underwent subtotal hysterectomy (cervix not removed) and having a history of cervical cancer or moderate to severe cervical changes should undergo screening like routine till 20 years after surgery.
- Women who have had a total hysterectomy do not need to undergo cervical screening unless the surgery was done as a treatment for cervical precancer or cancer. [15]

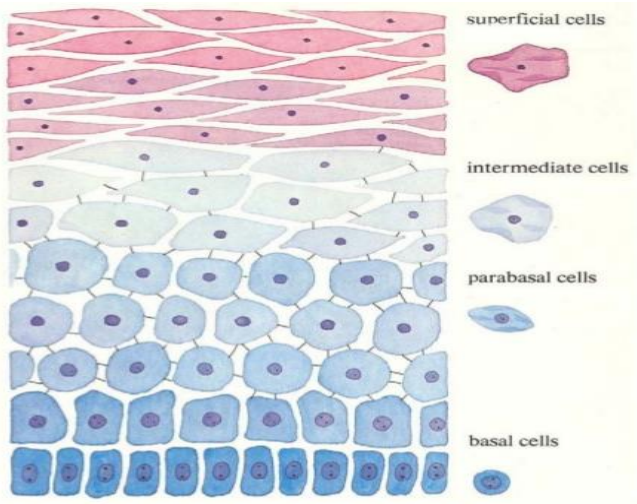
HISTOLOGY OF NORMAL CERVIX:

The cervix is spindle shaped and measures 2.5cm in length. It is bounded above by internal os and below by external os. The cervix is divided into 2 parts ectocervix and endocervix.

Endocervix is lined by high columnar ciliated epithelium with spindle shaped nuclei. The direction of cilia is downwards towards the external os. The glands are racemose in type and secrete mucous with high content of fructose. The mucosal lining of cervix is devoid of submucosa. The ectocervix is lined by squamous epithelium and consists of 4 layers.

1. **The superficial layer** – Five to eight rows of flattened cells with uniform nuclei and cytoplasm filled with glycogen. The nucleus becomes pyknotic and the cells detach from the surface. These cells from the basis for Papanicolaou testing.
2. **The intermediate layer** – Four to six rows of cells with larger amounts of cytoplasm in a polyhedral shape separated by intercellular space.
3. **The parabasal layer** – Two to four rows of immature cells with normal mitotic figures.
4. **The basal layer** – Single row of immature cells with large nuclei and small amount of cytoplasm.

FIGURE 1: Layers of squamous epithelium of cervix



The point where ectocervix and endocervix meet is called as squamocolumnar junction. The squamocolumnar junction is a dynamic point that changes in response to puberty, pregnancy, menopause and hormonal stimulation. At menarche, the production of estrogen causes the vaginal epithelium to fill with glycogen. Lactobacilli act on the glycogen and stimulate the sub-columnar reserve cells to undergo metaplasia and it advances from squamocolumnar junction.

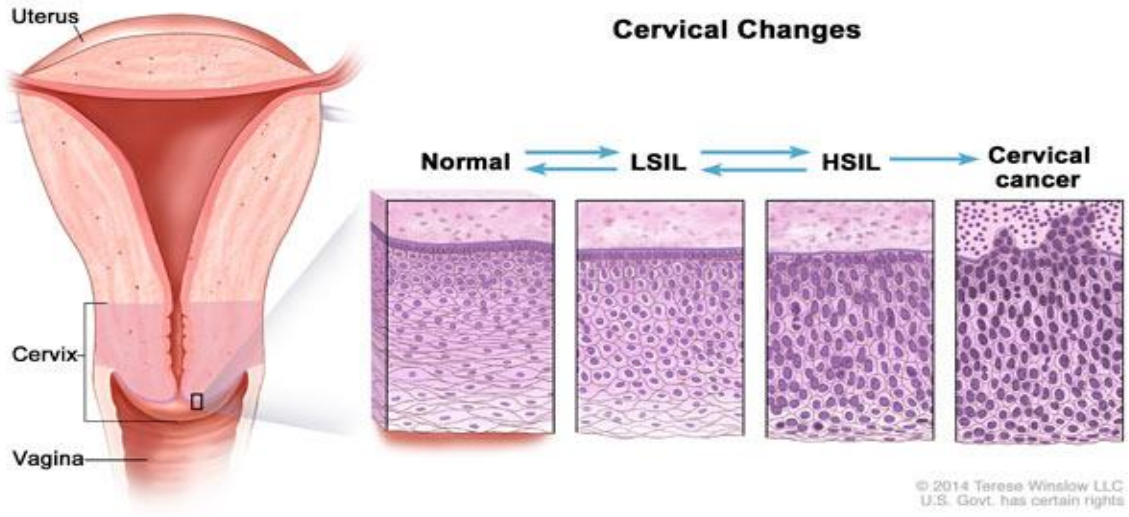
Cunningham, Leveno, Boom, Hauth, Rouse, Spong, Maternal physiology Williams Obstetrics 23rd Edition, the cervical glands undergo marked proliferation that by the end of pregnancy they occupy approximately half of the entire cervical mass, rather than a small fraction as in the non pregnant state. These normal pregnancy-induced changes represent an extension, or eversion, of the proliferating columnar endocervical glands. This tissue tends to be red and velvety and bleeds even with minor trauma, such as with Pap smear sampling. During pregnancy, basal cells near the squamo-columnar junction are likely to be prominent in size, shape, and staining qualities. These changes are considered to be estrogen induced. In addition, pregnancy is associated with both endocervical gland hyperplasia and hyper secretory appearance the Arias-Stella reaction that makes the identification of atypical glandular cells on Pap smear particularly difficult (Connolly and Evans, 2005).[16]

CERVIX IN PREGNANCY

Pregnancy produces dramatic alteration in the cervix. The changes are a result of increased estrogen content. There is hypertrophy of the cervical stroma. The endocervix is everted, especially in primiparous women. The changes begin in the early weeks of pregnancy and will be clearly apparent in the second trimester. In late pregnancy, there is less eversion and gaping of the endocervical canal is often present. The everted epithelium exposed to the acidic environment of the vagina produces a high degree of squamous metaplasia. This is the stage of greatest risk for initiation of dysplasia. In antenatal women, the decidual cells, trophoblasts and Arias-Stella reactions frequently cause confusion in the interpretation of cervical smears. Endocervical sampling is difficult in the women. Hormonal changes during pregnancy make it difficult to interpret the results. But many of the women it may be the only chance to get a routine Pap smear done.

Carcinoma insitu originates as a single focus in the change zone at the advancing squamocolumnar junction.

FIGURE 2: Showing progressive changes from normal to carcinoma cervix



METHODS OF TAKING THE SMEAR:

The collection device plays an important role in adequacy of the sample. The shape, surface, texture and material of the device may determine how much of the scraped material is deposited on the glass slide and is available for screening and analysis.

CERVICAL SMEAR:

Several methods are available for obtaining cytologic material from the uterine cervix. Smears obtained using an Ayre's spatula is the best and easiest method to screen. Wooden spatula is preferable to a plastic or a steel spatula. Wooden spatulas, because of the rough surface, can collect more material. Based on this spatula, may other devices have been developed. These include the endocervical brush, cervical brush, and cytobrush.

FUGURE 3: Coplin jar with Ayer's spatula and Cytobrush

The pointed version of Ayre's spatula, Aylesbury spatula was designed to sample both the endocervix and the transformation zone.

The cervical brush is a flexible plastic brush, which follows the shape of the cervix and is suitable for all cervices.

The endocervical brush is a small tooth brush like device with bristles made of nylon on one side and is useful to sample the endocervix.

The cytobrush is a device without bristles and is used to sample the entire cervix. A saline moistened cotton swab can also be used to sample the endocervix.

VAGINAL SMEAR:

An unlubricated spatula is introduced into the vagina. An Ayre's spatula is used to scrape the lateral wall of the vagina near the cervix.

OBTAINING A PAP SMEAR:

Proper patient preparation is necessary for obtaining a good smear. Certain factors or conditions may interfere with a Pap test.

1. Menstruation
2. Use of substances such as vaginal creams, jellies, medications, or spermicidal foams, for two to three days before the Pap test, as these substances may alter the pH of the cells or hide abnormal cells.
3. Douching for two or three days before Pap test, as douching can wash away surface cells.
4. Infections
5. Certain medications such as tetracyclines.

ADEQUATE SMEAR:

According to Bethesda system, an adequate smear should contain adequate transformation zone component. The smear should contain epithelial cells and both metaplastic and columnar cells.

PREPARATION OF THE SLIDE:

A speculum, preferably a Cusco's speculum is used. Any mucus or blood should be wiped with saline moistened cotton swab. The spatula is inserted with the long end in the os and is rotated through 360 degrees in a clock wise direction. The sample is then evenly smeared over the glass slide and the smear should be fixed as fast as possible.

FIXATION OF THE SLIDE:

All slides for the cytological study must be fixed immediately after smearing while the material is still wet. The fixing fluid commonly used is a mixture of equal parts of other and 95% ethyl alcohol. A cytospray can be used for fixation. Atleast 15 minutes is required for adequate fixation of smear. Slides may remain in the fixature for 7-10 days without deterioration.

Coplin jars made of glass or plastic material are commonly used as containers.

STAINING OF THE SLIDES:

The Papanicolaou staining technique has been used by all those who practice cytology of the genital tract.

PAPANICOLAOU STAINING TECHNIQUE:

The stains required are

1. Harris Haemotoxylin
2. Orange G
3. Polychrome stain EA 36

UNSATISFACTORY STAINING OF THE SLIDES:

It may be due to the following reasons:

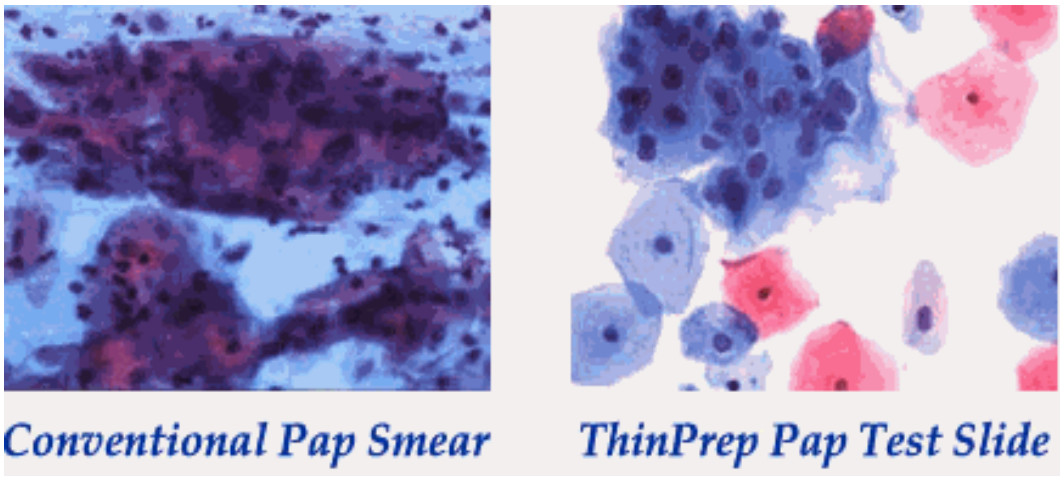
1. Drying before fixation of the slide. All the cells appear finally faintly pink and there is no or very little differentiation between cytoplasm and nucleus.
2. Inadequate fixation of the slide.
3. Usage of inadequate stains and alcohol.
4. Incorrect staining time.
5. Drying of the slide in between the staining procedures.

SHORR STAINING:

This technique (Shorr 1984) is much simpler and takes much less time than the Pap stain. It achieves good cytoplasmic differentiation but it does not adequately demonstrate the nuclear details. Hence, it is useful for hormonal analysis and not suitable foe detection of cancer.

NEWER TECHNIQUES

FIGURE 4: Showing cytological view of Conventional and Thin prep Pap test slide



THIN LAYER FLUID PREPARATION TEST:

Thin preparation Pap test also called as liquid based cytology.

Cervix is scraped with a spatula and the sampling device is then placed in a vial containing a special preservative with additional haemolytic and mucolytic agents. The general idea is to provide a well preserved sample that is automatically transferred to a slide as a coin sized thin layer. In the laboratory, the cells are collected either by extraction across a special filter (Thin Prep) or by layering onto a density reagent.

Comparisons of the conventional Pap smear with thin layer fluid preparations have shown a marked improvement in the adequacy of the specimen as evidenced by a more even distribution of cells, and reduction in cellular debris and RCBs. This in turns leads to decrease in the incidence of false positive diagnosis of cytological atypia and an excellent correlation with the detection of squamous abnormalities. The overall sample adequacy improved with the Thin Prep test, but the incidence of diagnosis of ASC-US was not reduced.

AUTOMATED SCREENING TECHNOLOGY:

The effective of any cervical cancer screening program that relies on cervical cytology is the quality control of the cytological review of Pap smears. This is essential for reducing the false positives and false negatives that invariably result from inter and intra observer variation. Automated screening techniques have recently been developed that can not only perform this quality control rescreening but can also be used for primary screening of cervical smears.

The following automated screening techniques that rely largely on neural network technology and are based on the computerized imagining and identification of abnormal cervical cells available Autopap300and PAPNET.

Of these, only the Autopap300 is approved by the USFDA for primary and secondary cervical screening while the PAPNET is only approved for secondary screening.

The Autopap300 system utilizes a specialized high speed video microscope, image interpretation software and specially designed field of view computers to image, analyse and classify abnormal cervical cells. The screened slides are given a score and adequacy

statement. Cases scoring a total of 30 or more are then rescreened by a cytopathologist for further evaluation.

HPV – DNA TESTING:

The etiopathological role of HPV in the development of cervical cancer has been proved beyond doubt. HPV 16,18,31,33,35,39,45,51,52,59 and 68 are known to be frequently associated with HSIL and invasive cancers of the cervix. Testing for the presence of HPV – DNA in the cervical cells is thus a potentially useful screening method, which could be incorporated in cervical cancer screening programs. There are various techniques available for HPV-DNA testing of which southern Blot hybridization is regarded as a laboratory gold standard.

This is however unsuitable for clinical use as it is laborious, tedious and requires fresh tissue.

TYPES OF SMEARS:

I. NORMAL SMEAR:

Three types of cells are found – superficial cells, middle squamous cells and basal cells.

1. Superficial cells – Acidophilic with characteristic pyknotic nuclei
2. Middle cells – Squamous cells, transparent, basophilic with vesicular nuclei.
3. Basal cells – Small rounded and basophilic

In addition, endometrial cells, histiocytes, blood cells and bacteria can be seen.

II. INFLAMMATORY SMEAR:

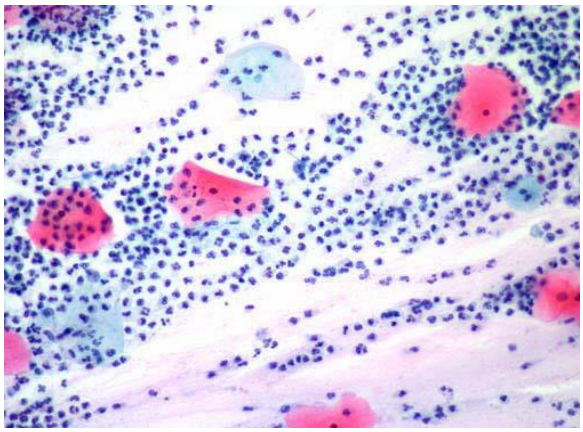
Inflammations are commonly caused by bacteria, viruses, fungi, and protozoa. The general pattern in acute inflammation is dominated by inflammatory exudates, large number of polymorphonuclear leucocytes, histiocytes and microorganisms. Fibrin and some RBC are also present.

In severe inflammation leucocytes are found in large clumps, often completely enveloping the epithelial cells. There is cellular debris as a result of necrosis. Epithelial cells often show degenerative changes such as vacuolation of cytoplasm and frayed cell borders. Nuclei are frequently abnormal and the degree of abnormality depends on the severity of the inflammation.

In acute inflammation of the endocervix, large clusters of naked nuclei showing inflammatory changes are found and these may cause diagnostic difficulties as they can be mistaken for malignant nuclei. The nuclei are often irregular and enlarged. Anisonucleosis are frequently prominent and some nuclei may appear hyperchromatic (darker then usual) while others look normal or paler than normal (polychromatic). The chromatic structure of the nucleus is generally fine granular though occasionally coarse granules may be seen. In contrast to nuclei from malignant cells, the individual

chromatin granules are even and equal in size. Multi-nucleation is frequent. In addition to these changes, nuclei of para-basal cells may exhibit degenerative features such as shrinkage and karyorrhexis i.e, breaking up of nucleus.

Figure 5: Inflammatory Pap smear



III. ABNORMAL / ATYPICAL SMEARS:

As per Bethesda smears abnormal smears are reported as

- Atypical squamous cells
  - of undetermined significance (ASC-US)
  - cannot exclude HSIL (ASC-H)
- Low grade squamous intraepithelial lesion (LSIL)
- High grade squamous intraepithelial lesion (HSIL)

Figure 6: Atypical squamous cells of undetermined significance (ASC-US)

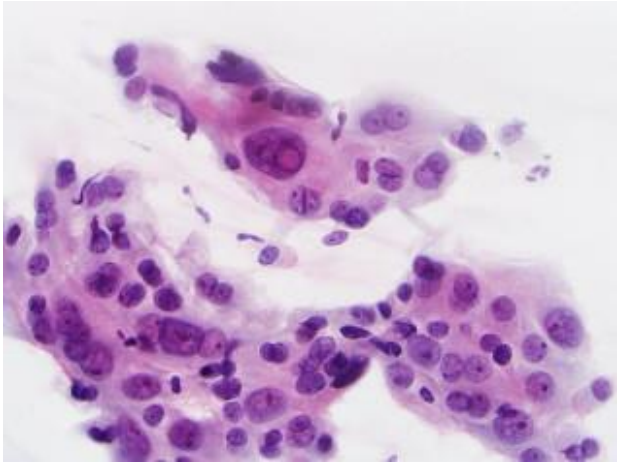


Figure 7: Low grade squamous intraepithelial lesion (LSIL)

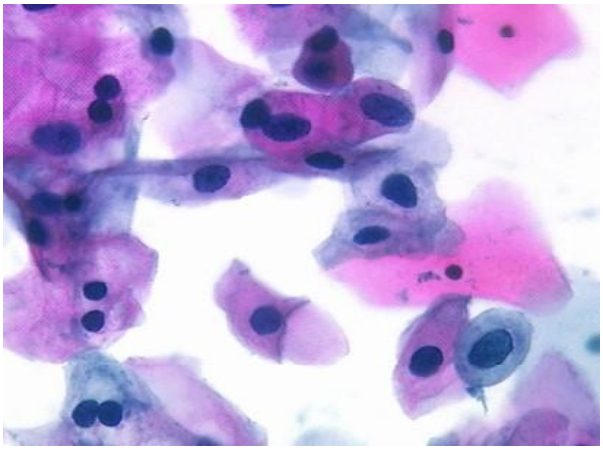
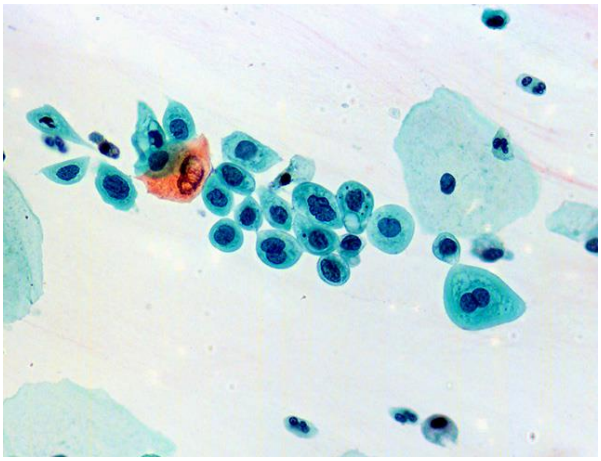


Figure 8: High grade squamous intraepithelial lesion (HSIL)



DYSPLASIA:

It is the process, which refers to an abnormal maturation of cells within the tissue. This process differs from metaplasia in the sense that normal differentiated cells are replaced by abnormal undifferentiated cells. It is often indicative of an early neoplastic process and is characterized by presence of nuclear changes such as anisocytosis (abnormal in size), poikilocytosis (abnormal in shape), hyperchromatism and presence of mitotic figures.

Dysplasias can be graded as

1. Mild dysplasia or CIN1.
2. Moderate dysplasia or CIN2.
3. Severe dysplasia or CIN3.

According to latest Bethesda classification, CIN 2 and CIN 3 are described as HSIL. The presence of HSIL is significant because these lesions have a high degree potential to progress to invasive cancer that needs to be treated. Sensitivity of Pap smear to detection of HSIL is 70-80% and specificity is 95-98%.

CYTOLOGICAL CLASSIFICATION:

PAPANICOLAOUS GRADING:

Grade I: Normal

Grade II: Presence of borderline atypical cells probably due to infection. No evidence of malignancy.

Grade III: Cells suspicious of malignancy

Grade IV: Presence of few malignant cells

Grade V: Presence of large number of malignant cells.

In 1988, the first National Cancer Institute (NCI) workshop was held in Bethesda, Maryland and resulted in the development of Bethesda System for cytological reporting.

BETHESDA SYSTEM FOR REPORTING CERVICAL CYTOLOGY (2014):

SPECIMEN ADEQUACY:

- satisfactory for evaluation
- unsatisfactory for evaluation

GENERAL CATEGORIZATION:

- Negative for Intraepithelial lesion or Malignancy
- Epithelial Cell Abnormality
- Others

INTERPRETTAION/ RESULT:

NEGATIVE FOR INTRAEPITHELIAL LESION OR MALIGNANCY:

When there is no cellular evidence of neoplasia

NON-NEOPLASTIC FINDINGS

- Non-neoplastic cellular variations
- Squamous metaplasia
- Keratotic changes
- Tubal metaplasia
- Atrophy
- Pregnancy – associated changes
- Reactive cellular changes associated with:
- inflammation
- radiation
- intrauterine contraceptive device (IUCD)
- Glandular cell status post hysterectomy

ORGANISMS:

- *Trichomonas vaginalis*
- Fungal organisms morphologically consistent with *Candida* spp
- Shift in flora suggestive of bacterial vaginosis
- Bacteria morphologically consistent with *Actinomyces* spp
- Cellular changes consistent with herpex simplex virus
- Cellular changes consistent with cytomegalovirus

EPITHELIAL CELL ABNORMALITIES:

- ❖ Squamous cell:
  - Atypical squamous cells
    - of undetermined significance (ASC-US)

- cannot exclude HSIL (ASC-H)

- Low grade squamous intraepithelial lesion (LSIL)
- High grade squamous intraepithelial lesion (HSIL)
- Squamous cell carcinoma

❖ Glandular cell abnormalities:

- Atypical
  - endocervical cells (NOS or specify in comments)
  - endometrial cells (NOS or specify in comments)
  - glandular cells (NOS or specify in comments)
- Atypical
  - endocervical cells, favour neoplastic
  - glandular cells, favour neoplastic
- Endocervical adenocarcinoma in situ (AIS)
- Adenocarcinoma
  - endocervical
  - endometrial
  - extrauterine
  - not otherwise specified (NOS)

❖ Other cancers (e.g. lymphoma, metastasis, sarcoma).[17]

REVIEW:

Lurain JR, Underwood PB, Rozier JC, et al & **Rivlin ME, Woodlif JM, BowlinRB, et al** reported incidence of abnormal Pap smears detected during pregnancy varies with the study population, however, a 1% to 8% incidence of abnormal cervical cytology is commonly reported.[18,19]

Brinon LA , Hoskins WJ, et al in a number of case control studies risk of cervical cancer was found to be inversely related to age at 1st sexual intercourse, with approx. 2 fold differentials between those with consummation before 16years of age and those having it after 20 years of age.[20]

Kaminski PF, Lyon DS, Sorosky JI, Wheelock JB, Podczaski ES, studied the significance of squamous atypia encountered during routine Papanicolaou smear screening in pregnancy, and included 76 pregnant women during a 4-year period. All were evaluated with repeat cytology and colposcopy during pregnancy and again postpartum. Colposcopic examination during pregnancy revealed a normal transformation zone without evidence of intraepithelial neoplasia in 46 women. In six of these women, repeat cytology was interpreted as cervical intraepithelial neoplasia (CIN) grade 1. In 30 women, an abnormal transformation zone was identified-14 with a negative repeat cytology. In five women, the transformation zone was interpreted as compatible with CIN 2 or CIN 3. Colposcopically directed biopsies were performed in 31 women, in all but two postpartum. Of the 76 women, human papilloma virus or CIN was identified on biopsy in 16 women (21%). They propose that an isolated report of atypical squamous cells on cervical cytology obtained at the initial prenatal visit does not warrant colposcopic evaluation during pregnancy, unless a repeat cytology suggests CIN. If a subsequent cytology is abnormal, postpartum colposcopy and colposcopically directed biopsies seem appropriate, since the prevalence of HPV or CIN was 21%.[21]

Pisharodi LR, Jovanoska S, to study pregnancy-related changes in cervicovaginal smears and to distinguish them from neoplasia and dysplasia. One hundred consecutive abnormal cervicovaginal smears from pregnant women obtained during 1992-1993 were reviewed. Corresponding biopsies that were available were also reviewed for cytological correlation. Sixty-one percent of cases showed inflammation changes, 21% contained low-grade squamous intraepithelial lesion, and 9% had high-grade squamous intraepithelial lesion. Diagnostic problems were encountered with decidual cells, Arias-Stella reaction and trophoblastic cells and this study concluded that both the clinician and pathologist must be aware of diagnostic pitfalls and false positive diagnoses in pregnancy. Hence, it is extremely important that clinician must notify the pathologist about the pregnancy status of the patient.[22]

Nevin J and Colleagues 1995, reported that approximately 1 in 2000 pregnancies is associated with cervical cancer and approx. 3% of women with cervical cancer were pregnant.[23]

Jones WB, Shingleton HM and colleagues reported that only approx. 1.4% of all cervical cancers diagnosed in association with pregnancy. Mean age of pregnant women with invasive cervical cancer is 31.8 years.[24]

Jain AG, Higgins RV, Boyle MJ, studied to determine whether prenatal colposcopy is beneficial in pregnant women with squamous atypia, atypical squamous cells of undetermined significance, or low-grade squamous intraepithelial lesions on an initial screening Papanicolaou smear. A retrospective chart review identified a cohort of pregnant patients referred to the colposcopy clinic at Carolinas Medical Centre between October 1991 and December 1994. Results of the colposcopic examination, cervical biopsy specimens, postpartum evaluation, and postpartum treatment were recorded. Prenatal colposcopy was performed on 253 women and the colposcopic impression was normal or consistent with low-grade squamous intraepithelial lesions in 235 (93%) of the women. Postpartum Papanicolaou smears were obtained in 224 patients; 71 (32%) were normal, 145 (65%) were unchanged, and 8 (3%) showed high-grade squamous intraepithelial lesions. Of the 69 patients who had postpartum cervical biopsy, 4 were found to have high-grade squamous intraepithelial lesions. Eight of the 10 women with biopsy proved high-grade squamous intraepithelial lesions were compliant with treatment after delivery. Histologic examination of the cervix with tissue obtained by either loop conization or cold knife conization showed no evidence of invasive carcinoma and this study concluded that abnormal Papanicolaou smear in a pregnant patient does not require colposcopic evaluation during pregnancy. Progression of low-grade dysplasia to carcinoma during pregnancy is unusual, and no patient in this study was found to have invasive cancer.[25]

Sood AK, Sorosky J, the overall progression for all stages of cervical cancer during pregnancy is probably similar to that for non pregnant women. American Family of physicians (2000), women diagnosed during pregnancy & those diagnosed during puerperium & the control subjects did not suffer significantly, in age, gravidity, parity, or smoking status. Pregnancy does not modify disease's prognosis and the therapeutic choice depends on the stage of the disease.[26]

Palle C, Bangsboll S, Andreasson B, conducted a retrospective study on 305 pregnant women to determine the progression/regression rate of cervical intraepithelial neoplasia in pregnancy and to describe the number of patients requiring treatment for cervical neoplasia

during or following the pregnancy. The colposcopic cytologic and histologic findings of repeated examinations during pregnancy and of the subsequent examination eight weeks postpartum were registered and compared. All smears were obtained by cotton bud and cytobrush. Colposcopy was performed using standard techniques and cervical biopsies were taken in cases of colposcopic abnormalities. Endocervical curettage was omitted during pregnancy. At postpartum evaluation colposcopy, directed biopsies and endocervical curettage were performed in all cases. One hundred and two patients (33%) were followed only by cytology and colposcopy. The remaining 203 patients (67%) had one to four Colposcopically directed biopsies during the pregnancy. 25% showed spontaneous regression while 72% of the women exhibited progression (28%) or persistence (47%) in the severity of cervical neoplasia and this study concluded that the high persistence rate of cervical intraepithelial neoplasia in pregnancy lead them to recommend a liberal use of colposcopically directed biopsies during pregnancy and to ensure a high follow-up rate in postpartum period.[27]

Dunn TS, Bajaj JE, Stamm CA, Beaty B, conducted a study to evaluate the effectiveness of colposcopy of the uterine cervix in pregnant patients with minimally abnormal Papanicolaou smears. Two hundred, indigent, pregnant patients with atypical cells of undetermined significance (ASC-US) or low-grade squamous intraepithelial neoplasia (LGSIL) on Papanicolaou smear underwent colposcopy and endocervical evaluation. Directed biopsies were performed on 64 patients. One hundred thirty-five patients were complaint with postpartum Papanicolaou smears or colposcopy with endocervical evaluation. One hundred eighty-seven pregnant patients had satisfactory prenatal Papanicolaou smears, colposcopy and endocervical brushings, 4.7% of prenatal biopsies, 0.8% of postpartum Papanicolaou smears, 2.2% of postpartum endocervical brushings, and 7.9% of postpartum biopsies. No invasive cervical cancer was detected and their study concluded that antepartum colposcopic evaluation did not add in the management of minimally abnormal Papanicolaou smears in their population of pregnant women.[28]

Morimura Y, Fujimori K, Soeda S, Hashimoto T, Takano Y, Yamada H, Yanagida K, Sato A, studied the clinical significance of uterine cervical cytology during pregnancy. Of the 1593 pregnant women, the patients with abnormal cytology were followed up and performed histological confirmation on colposcopic biopsy specimen. An incidence of

abnormal cytology and cervical neoplasm during pregnancy were 1.63% (26 cases) and 0.82% (13 cases), respectively. The incidence of abnormal cytology in the pregnant women was significantly higher than that (0.9%) in mass-screened, non-pregnant 214,375 women under the age of 45 years ($p < 0.001$). there was no significant difference of the incidence of cervical neoplasm between in the pregnant women and in mass-screened, non-pregnant women (0.82% vs 0.46%). The accuracy of cervical cytology during pregnancy was 45.0% and this was not significantly different from that (27.6%) in the mass-screened, non-pregnant women. Since, cervical screening cytology has an equal effectiveness to that in the mass-screened non-pregnant women, routine cervical cytology is highly recommended during pregnancy.[29]

As per the IARC multi-centeric case control study by **Munoz N, Franceschi S, Bosetti C, et al,** a direct association between number of full term pregnancies and squamous cell carcinoma of cervix was revealed. The odds ratio for cancer cervix in women who had 7 or more full term pregnancies, compared with nullipara and women having 1 or 2 full term pregnancies. According to Talebian & co-workers (1976) the incidence of abnormal cytology is about 3%, which is similar to that report for non pregnant women.[30]

Douvier S, Filipuzzi L, Sagot P, approx. 30% of women diagnosed with cervical cancer are in their childbearing years. Prenatal care provides an excellent opportunity for cervical cancer screening. The incidence of abnormal Pap smear has been reported in 5-8% of pregnant women. But we must know that Pap smears have cytologic modifications because of pregnancy. All abnormal smears have to be referred to colposcopic examination. The squamocolumnar junction is visualized in almost 100% of cases. The sensitivity of colposcopy is nearly 87% with complete concordance in 72.6%. Colposcopically directed biopsies have a good correlation with the final diagnosis with very minimal risks for both mother and fetus. The high rate of complications (hemorrhage, abortion, premature labor) and residual lesions in half of cases do not encourage conization during pregnancy. The final treatment is carried out after delivery. The only absolute indication for conization in pregnancy is to rule out microinvasive disease or make the diagnosis of invasive carcinoma when such a diagnosis will alter the timing of delivery but also when there is no satisfactory colposcopy and a high-grade Pap smear. In these cases conization is performed for

diagnostic and not therapeutic purpose. We must be aware of the high rate of loss of follow-up (6-33%).[31]

Buchmayer, S., Sparén, P. and Cnattingius, S, studied that whether signs of infection in Pap smears imply a risk factor for preterm delivery are conflicting. In a large population-based study, they combined information from the Swedish Medical Birth Register and the Swedish Pap smear Screening Register. The presence of Coccobacilli or Trichomonas vaginalis in Pap smears increased the risk of small-for-gestational-age delivery (or 1.3 and 1.4, respectively). Signs of infection in Pap smears were generally not associated with an increased risk of antepartum death or preterm birth. However, the presence of Coccobacilli in Pap smears within 4 weeks before delivery was associated with a more than fourfold increase in risk of very preterm delivery (≤31 weeks, or 4.7). This indicates that if Coccobacilli are detected in Pap smears during the second trimester, antibacterial treatment may lower the risk of very preterm delivery.[32]

According to **Hogewoning CJ at al,** cervical cancer is mostly associated with Human Papilloma virus (HPV) infection. Women using oral contraceptives are more likely to be exposed to HPV than those using barrier methods or not having sexual intercourse. Thus, even if oral contraceptives are not casually associated with cervical cancer, women positive for HPV who use them instead of barrier methods might be more likely to be diagnosed with cervical cancer.[33]

Kaplan KJ, Dainty LA, Dolinsky B, Rose GS, Carlson JMcHale M, Elkas JC, conducted a retrospective study, to examine the prognosis and recurrence risk for patients with cervical squamous intraepithelial lesions (SILs) diagnosed during pregnancy, who gave birth at Walter Reed Army Medical Center (Washington, DC) or the National Naval Medical Center (Bethesda, MD) between 1986 and 1997. One hundred fifty-seven patients with SILs who underwent antepartum and postpartum evaluation were identified from a total of 6248 record of birth at those two institutions. Results of one hundred twenty-nine patients were diagnosed with low-grade squamous intraepithelial lesions (LSILs) antepartum. Of these patients, 49 (38%) had a previous history of abnormal cervical cytology (30 LSILs and 19 high-grade squamous intraepithelial lesions [HSILs]). Sixty-two patients with antepartum LSILs had disease regression postpartum, 32% had persistent LSILs follow-up data were available for 98 patients (60%), 78 of whom had antepartum LSILs and 20 of whom had antepartum

HSILs. Sixty percent of patients with antepartum LSILs detected on Pap smear developed recurrent LSILs within 5 years, and all 20 patients with antepartum HSILs developed recurrent HSILs with in 5 years and this study concluded that most cases of LSIL regressed or remained stable during pregnancy. All cases of HSIL diagnosed antepartum persisted in the postpartum period, and 11% of patients with antepartum HSILs were found to have invasive carcinoma postpartum. High rates of recurrence for both LSIL and HSIL were noted 2-5 years after diagnosis of SIL in the antepartum.[34]

In study conducted in Department of Obstetrics and Gynaecology, Tohoku university, Sendai, Japan by **Abe Y, Ito K et al 2004** the Ministry of Health, Labor and Welfare proposed that cervical cancer screening should be conducted for women aged 20 to 29 years old in japan and there are insufficient data available in Japan concerning the screening conducted for women under the age of 30 so they made a survey of the results of cervical cytological examination for pregnant women. 28,616 pregnant women were examined as subjects of a study group. A group of 1,08,289 women subjected to group screening for cervical cancer in Miyagi Prefecture, and were studied as a control group. The rate of subjects who required close examination in the pregnant women's group was significantly higher than that in the mass screening group (1.12% vs 0.84%). The rate of close examination was significantly higher in the women 19 years old or younger compared to those in the age group of 25 to 39 years old. The rate was also significantly higher in women aged 20 to 24 years old than those who are 25 to 34 years old. Of the 321 subjects who required close examination, 34 cases underwent treatment, and 17 cases were under age 30. Moreover, all three cases of micro-invasive and/or invasive carcinoma were under the age of 30 years (23, 25, 27 years old respectively) and this study results suggest that screening of cervical cancer in pregnancy is a useful means to find cervical neoplasia in young women and is effective in reducing the cervical cancer morbidity rate.[35]

Zoundi – Ouanqo O, Morcel K, Clane J M, and colleagues, studied to define a practical attitude for the management of pregnant women with cervical intraepithelial neoplasia(CIN) and cervical cancer. The prevalence of the HPV infections is unchanged among pregnant women with infection by low risk viruses. The viral load increases at the time of the pregnancy, and decreases in the post-partum period. Cervical cytology is easily to perform with reliable results: among the 5% of pathological cervical smears, low grade lesions

predominate. The high grade smears require colposcopic exploration, usefully completed by directed biopsies to rule out invasive lesions. Surveillance of high grade CIN is required during pregnancy with post-partum control; most regress. In France during the year 2000, 189 cancers of the uterine cervix were detected during 774.782 pregnancies. Clinical diagnosis is delayed by the non specific clinical signs and the histological aspects of the lesions which are identical with those observed in young woman. The intrinsic outcome of cancer is not modified by pregnancy, and the cesarean section is often preferred (vaginal delivery likely facilitates vascular dissemination). For fetal reasons, a therapeutic delay can be proposed for small sized lesions with a favorable histological subtype and no progression after 20 weeks of gestation and this study concluded that pregnancy offers the opportunity to perform cervical smears in women not regularly followed. A conservative attitude with a revaluation in postpartum can be proposed in the event of diagnosis of CIN during pregnancy. Pregnancy has little influence on invasive cervical cancers.[36]

Serati M, Uccella S, Laterza R M, et al is a prospective study whether pregnancy influences the natural history of cervical intraepithelial neoplasia (CIN) and the aim was to evaluate the evolution of CIN in pregnant women at University of Insubria, Italy, between 2003 and 2007, to understand the impact of pregnancy on the evolution of CIN. Women with CIN 1 discovered during pregnancy were compared to a group of non-pregnant fertile patients with first diagnosis of CIN 1. A total of 78 women were included: 36 (46.2%) with CIN 2-3 and 42 (53.8%) with CIN 1. In women with CIN 2-3, no invasion was suspected during pregnancy and at post-partum evaluation, no invasive or microinvasive cancer, and 19 (52.7%) persistent CIN 2-3, and 17 (47.3%) regressions were diagnosed. In the group of CIN 1, they recorded six (14.3%) progressions to CIN 2-3, seven (16.6%) persistent CIN 1 and 29 (69%) regressions. The control group of non-pregnant women had a lower regression rate (37/76: 48.7%) in comparison to pregnant women ($p=0.03$) and this study concluded that expectant management for CIN 2-3 diagnosed during gestation is safe. When discovered during pregnancy, CIN 1 has a significantly higher tendency to spontaneous regression in comparison to non-pregnant condition.[37]

Fader AN, Alward EK, Niederhauser A, et al conducted a retrospective cohort study referred for colposcopy from 2004-2007 at four academic centres to identify the prognostic indicators associated with postpartum regression of cervical dysplasia diagnosed in

pregnancy.one thousand seventy-nine patients were identified. Of patients who underwent biopsy, results correlated with or were less severe than colposcopic impression in 83% with CIN 1 and 65% with CIN 2/3. Fifty seven percent had follow-up postpartum, with 61% reverting to normal. Resolution of cervical dysplasia was inversely associated with smoking ($p = .002$). No progression to cancer occurred during pregnancy.[38]

Nantaka Ngaojaruwong, Chutawadi Vuthiwong, Peerapun Punpuckdeekoon, Narut Thongsorn, Phramongkutklao Hospital, Bangkok, Thailand conducted a prospective analysis on 384 pregnant women between 1 September 2006 and May 2007 to determine the prevalence of abnormal Papanicolaou smear with pregnancy outcome. Data collection included demographic characteristics, risk factors of cervical cancer and results of Papanicolaou smear and outcomes of pregnancy. From 384 cases, the prevalence of abnormal Pap smear was 38% candida species 23.4%, bacterial vaginosis 14.0%, trichomonas species 0.2%, and low-grade squamous intraepithelial lesion (LSIL) or LSIL with HPV 0.4%. Risk factors found in pregnant women with pre-invasive lesion were husband with multiple partners and smoking. Pregnant women with preterm birth and PROM occurred in women with candida spp 21.9% and 5.9% where as bacterial vaginosis 9.4% and 4.4% and this study concluded that prevalence of abnormal pap smear was 38%.[39]

Ma L, Bian M L, and colleagues, studied the characteristics of cervical cytology from Aug. 2006 to Jan. 2010, 5152 pregnant women who received antenatal and postpartum examination underwent cervical cytological screening by liquid-based cytological test (LBC) in China-Japan Friendship Hospital. The abnormal LCT results were followed up at 3 months after postpartum. The diagnosis of high-grade squamous intraepithelial lesions (HSIL) and squamous cell carcinoma (SCC) were based on colposcopic examination and biopsy during pregnant. The diagnosis of atypical glandular cells (AGC) was based on curettage and biopsy at postpartum 6 weeks. The histopathology of biopsy were compared and analyzed. Results showed cervical cytological changes related with pregnancy: among 5152 cases, navicular cells was found in 3215 cases. This study concluded that the navicular cells were primarily morphological characteristics of cytology during pregnant and postpartum women. Some changes were easily confused with malignant lesions. It should be careful discrimination, and avoid excessively diagnosis and misdiagnosis and suggested that these women should follow up closely and expand the indication of colposcopic biopsy.[40]

Dinc A, this study was based on a descriptive method in order to evaluate the results of PAP smear screening during pregnancy for prevention of cancer, the research involved 110 pregnant women registered at the Obstetrics and Gynecology Polyclinic of Bagcilar Training and Research Hospital and 86 non-pregnant women of the same ages as a control group. The average ages were 27.1±4.70 for the pregnant women and 28.8±4.24 for the control group. 60.7% of cases had previously heard of a PAP smear test, 49% were aware of why PAP smear tests were conducted, 26.4% of pregnant participants and 27.3% of non-pregnant participants had previously undergone a smear test. In this study, smear results of all cases were 95.4% sufficient. 18.2% of pregnant cases had an infection, 54.5% had reactive cellular change, and 0.9% had atypical squamous cells of undetermined significance (ASC-US). 3% of non-pregnant cases had an infection, 58.1% had reactive cellular change, 3.5% had atypical squamous cells of undetermined significance (ASC-US), and 1.2% had low-grade squamous intraepithelial lesions (LGSIL).[41]

Ivanov S, conducted a retrospective research work for 10 years period and examined - 20 patients with precancer and cancer of the vulva combined with pregnancy - 70 patients with cervical cancer and pregnancy - 30 patients with ovarian cancer and pregnancy – 60 patients with breast cancer and pregnancy .The patients with early stages of the cervical cancer connected with pregnancy are treated conservatively. The patients with invasive cervical cancer and pregnancy, the gestational age and the wish of the patient to have a baby are the main factors formulating the kind of treatment. In early 1st and IInd trimester the patients with IB and IIA stage are treated with radical hysterectomy together with the foetus or the standard chemo-radiotherapy. Advanced cervical cancer-IB2-II stage, pelvic radiotherapy with chemotherapy is used if the cancer is diagnosed in the first 20 gestational weeks. According to the study and the most foreign authors the adnexal masses must be eradicated surgically in the IInd trimester of the pregnancy (13-16 gestational weeks). The most ovarian cancers are in early stage and chemotherapy may be delayed after the delivery especially for epithelial tumors 1st stage. This study concluded that the oncological types of treatment including surgery, chemotherapy and radiotherapy (with exception of radiotherapy for small pelvis and abdominal cavity) may safely be applied after the 1st trimester of the pregnancy.[42]

In the study conducted by **Singh P, Baghel V**, 590 cases were screened during one year period and the mean age of the pregnant women under the study was 23.44+_ 3.96 years, most of whom were in the second trimester of gestation. 9.2% cases were younger than 20years of age and large proportion of 56.6% was between 20-24 years of age. None of the

pap smears reported any intraepithelial lesion. Most of the subjects (74.6%) were married above 18 years of age delaying their sexual debut, and major proportion of the cases around 81% were nullipara or primipara having one full term normal delivery and that might be the probable reasons why abnormal Pap smear was not detected.[43]

Henes M, Neis F and colleagues, retrospectively analyzed all pregnant women with an abnormal cervical cytology or condyloma in dysplasia clinic between 01/2008 and 12/2011. Classification of the cervical cytological results was performed according to the Munich II nomenclature and a biopsy was obtained from most patients. Groups were defined in order to assess regression, persistence and progression. In this study a total of 65 pregnant women were treated in the dysplasia clinic. The reason for referral was Pap IIID in 46.2%, Pap IVa in 40% and Pap III or Pap II with condyloma in 6.2% patients. Only one patient presented with a Pap IVb finding. The pregnancy was continued in all but one case. Postpartum, a total of 40% of cases, were in remission. A partial remission occurred in 4.6%. Persistence of the abnormalities was observed in 26.2%. Progression was documented in 3% and 71.1% were able to have a vaginal delivery. A caesarean section was performed in 22.2%. A total of 4.4% suffered a miscarriage, which was not caused by the colposcopy. The distinctive feature of this study showed that with high number of follow-up examinations, even women with highly dysplastic changes in pregnancy, who are regularly monitored can be advised to continue pregnancy and Vaginal delivery is possible in most cases.[44]

Jose Candido C, Xavier Junior, Rozany M, Dufloth RM, Do Vale DB, Tavares TA, Zeferino LC, to evaluate the prevalence of cervical smear results varies between pregnant and non-pregnant women stratified by age group. Studied High-grade squamous intraepithelial lesions in pregnant and non-pregnant women. 1,336,180 pregnant and non-pregnant women aged between 24 and 34 years underwent cervical cancer screening in Primary Health Care of the national health system in the area of Campinas in Brazil during the period of 2005-2009. Cytological prevalence of high-grade squamous intraepithelial lesion was similar in pregnant and non-pregnant women, regardless of age. The results indicate that there are no reasons for specific approaches to cervical cancer screening for pregnant women. Nevertheless, during prenatal care there is an opportunity to carry out cervical smear test for women who have not been tested in the last three years or according to current recommendations.[45]

Study conducted by **Eaker S et al**, showed that peak age of incidence of pre cancerous lesions of the cervix peaks with the occurrence of pregnancies in the age range 25-35 years.[7]

Himabindhu P, Asmal Kanwal, Vasudha, Siddhartha Medical College, Andhra Pradesh conducted a prospective analysis on 200 pregnant women between June 2010 and October 2011 to screen for cervical neoplasia and pre-malignant diseases in pregnant women during first antenatal visit who do not have access to routine health care. Data included demographic characteristics, risk factors of cervical cancer and results of Papanicolaou smear. 89.5% of antenatal women had inflammatory smear and 0.5% LSIL. Risk factors found in pregnant women with husband had multiple sexual partners, history of exposure of spouse to extramarital relation, HIV positive and genital warts. The cervical cytology and related education were highly recommended in antenatal women to increase the cervical cancer screening coverage.[46]

Mariusz Skoczynki, Anna Kwasniewska, Anna Gozdzicka-Jozefiak et al, to estimate Human Papillomavirus (HPV) prevalence and some risk factors in pregnant women at term. The latent infection may take part in HPV transmission during pregnancy. It was important to determine the role of such factors as age, parity, use of contraception, the number of sexual partners in prevalence of HPV in pregnant women with normal cervical cytology. The prevalence of HPV was investigated by polymerase chain reaction method. It included 74 pregnant with normal cytology without clinical signs of HPV infection. Human Papillomavirus was found in 26 (35.14%) of 74patients. Slightly higher values of the HPV prevalence were determined only in the samples of women younger than 26 years old, with more than one partner and use of contraception. Significant differences were not found and this study concluded that sexual manners as risk factors may take part in HPV prevalence in young pregnant women at term.[47]

Bhanumathy M, conducted a prospective study on screening for cervical cancer during pregnancy. Study enrolled 200 normal pregnant patients admitted at Sri Rama Krishna Hospital from September 2012 to January 2014. Majority of the patients involved in study were in the age group of 20-35years with only 3.5% below 19yrs and 2% above 35years with mean age of 26.9years. Most of the patients were married at 20-30yrs of age while only 4.5% were married after 30 with mean age of marriage 23.4yrs. Importantly 15% had an early marriage between 15- 19yrs. Most of patients who consented for study belonged to third

trimester (91.5%) followed second trimester (17%) with average of 32.7wks. About 80% had knowledge regarding screening for cervical cancer. Concluded as PAP smear being a cost effective, easy to perform test, can be carried out even in pregnant woman. It does not interfere with the natural course of pregnancy and hence safety is ensured. Pregnancy is a potential opportunity to counsel and educate them regarding the significance of screening. [48]

Studies compared Papanicolaou test results obtained during pregnancy and post-partum on 1351 pregnant women who delivered at Ise Red Cross Hospital between January 2010 and December 2014, 1213 underwent Pap test at early pregnancy and post-term. Results o the Pap test were different in 32 patients. Of 1191 patients negative for intraepithelial lesions or malignancy in early pregnancy, 16 had other cytological abnormalities post-term. They performed therapeutic conization post-partum in four patients. The Pap test results in early pregnancy of the four patients were negative for intraepithelial lesions or malignancy in one patient, atypical squamous cells of undetermined significance in one and high grade squamous intraepithelial lesion in two. Concluded that the results of the Papanicolaou test during pregnancy may not be accurate because of the influence of hormones associated with pregnancy. Taking advantage of one-month post-partum screening visit can lead to early detection of cervical cancer in young people. [49,50]

MATERIALS AND METHODS

Source of Data: Total of 137 antenatal women who have visited to OPD of Department of Obstetrics and Gynecology at R.L. Jalappa Hospital and Research Centre constituent of Sri Devaraj Urs Medical College, Tamaka, Kolar, from January 2016 to June 2017 were included in my study. Institutional ethical clearance certificate was obtained before start of study.

STUDY DESIGN: Cross – sectional study

STUDY PERIOD: 18 months.

SAMPLE SIZE CALCULATION: 137

- Sample size was estimated by using the proportion of LSIL in ANC cases at 0.5% detected pap smear from the study by Himabindu et al.[47] using the formula
- P = 0.5% or 0.005
- q = 99.5% or 0.995
- d = 2% or 0.02
- Using the above values at 99% Confidence level a sample size of 124 ANC subjects will be included in the study.
- Considering 10% Nonresponse a sample size of 124 + 13 ≈ 137 subjects will be included in the study

Formula used: $n=Z_{\alpha}^{2}\ p\ q\ /\ (d)^{2}$

D= absolute error

INCLUSION CRITERIA:

All Antenatal women of 14 weeks to 40 weeks of gestational age attending outpatient department for antenatal care at Sri R L Jalappa Hospital and Research Centre during the study period.

EXCLUSION CRITERIA:

- Pregnant women-
- Who have been previously diagnosed with cervical pathology
- With unexplained vaginal bleeding
- In established labor
- With premature rupture of membranes
- Having history of recent coitus or using any vaginal medications.

MATERIALS:

- Vaginal speculum
- Wooden Ayer's spatula
- Clean glass slides
- Fixative containing 95% ethyl alcohol
- Cotton swabs

METHODOLOGY:

It was a cross-sectional study conducted in the Department of Obstetrics and Gynecology attached to Sri Devaraj Urs Medical College, Tamaka, Kolar from January 2016 to June 2017

Total 137 cases meeting inclusion criteria were registered for the study. A complete menstrual history, gynecological history, obstetric history, previous medical and surgical illness will be taken. The family history with emphasis on carcinomas of genital tract in mother and sisters will be taken. Women were interviewed about their age at marriage, educational status, fertility history, spouse's employment status, sexual partners and smoking habits. General clinical examination and complete obstetric examination was done. Necessary investigations such as

- Complete blood count.
- Blood group and Rh typing.
- Complete urine analysis.
- Random blood sugar.
- HIV, HBsAg, VDRL, were done.

Pap smear was taken from the squamocolumnar junction of cervix, after asking the patient to empty her bladder and obtaining an informed consent.

Patient is placed in dorsal position; under aseptic precautions Cusco's speculum is inserted to visualize the cervix, under good illumination.

Inspection of cervix done, findings noted.

Ayer's spatula is inserted and placed at the cervical OS, so the longer end goes into the cervical canal and smaller end rest on ectocervix.

Spatula is rotated through 360^0 maintaining contact with ectocervix.

Sample smeared eventually on the slide and fixed immediately with cytofix spray to avoid air dry.

Sample is stained using the PAP stain, in which the cells retain tintorial dyes and acids.

Excess of dye is washed under water at slow stream.

PAP smears were reported as per modified Bethesda Classification (2014) and reporting was given as normal smear, inflammatory smear, ASC-US, ASC-H or LSIL, HSIL & AGC.

STATISTICAL ANALYSIS:

- Data was entered into Microsoft excel data sheet and was analyzed using SPSS 22 version software. Categorical data was represented in the form of frequencies and proportions. Chi-square was used as a test of sigificance. Continous data was represented as mean and standard deviation.
- p value <0.05 was considered as statistically significant.

OBSERVATION AND RESULTS

Cervical cancer is the 2nd leading cause of female cancer deaths in India. This study included 137 antenatal women of 14 weeks to 40 weeks of gestational age attending outpatient department for antenatal care at Sri R L Jalappa Hospital and Research Centre from December 2015 to June 2017

The following are the tables, which will give a descriptive analysis of the age distribution, the parity distribution, period of gestation, age at marriage, contraception usage, risk factors of carcinoma cervix, socioeconomic status, education, occupation of the patients and its association with cytologic reports of Pap smear.

TABLE 1: DISTRIBUTION OF CASES ACCORDING TO KNOWLEDGE OF PAP SMEAR

KNOWLEDGE	NO. OF CASES	PERCENTAGE
Aware	44	32.1%
Not aware	**93**	**67.9%**
Total	137	100%

In my group out of 137 subjects 67.9% were not aware of routine and evidenced base screening for cervical cancer. They were unwilling for a Pap smear to be done, as they were concerned about well being of the fetus.

GRAPH 1: DISTRIBUTION OF CASES ACCORDING TO KNOWLEDGE OF PAP SMEAR

TABLE 2: DISTRIBUTION OF CASES ACCORDING TO EDUCATION

EDUCATION	NO. OF CASES	PERCENTAGE
Uneducated	**62**	**45.3%**
Primary	43	31.4%
Secondary	16	11.7%
Graduate	16	11.7%
Total	137	100%

In my study group most the patients were uneducated (45.3%) and 31.4% of the women received education up to primary school followed by secondary school education in 11.7% and 11.7% were graduates. Women who were graduates were aware of screening tests for cancer cervix.

GRAPH 2: DISTRIBUTION OF CASES ACCORDING TO EDUCATION

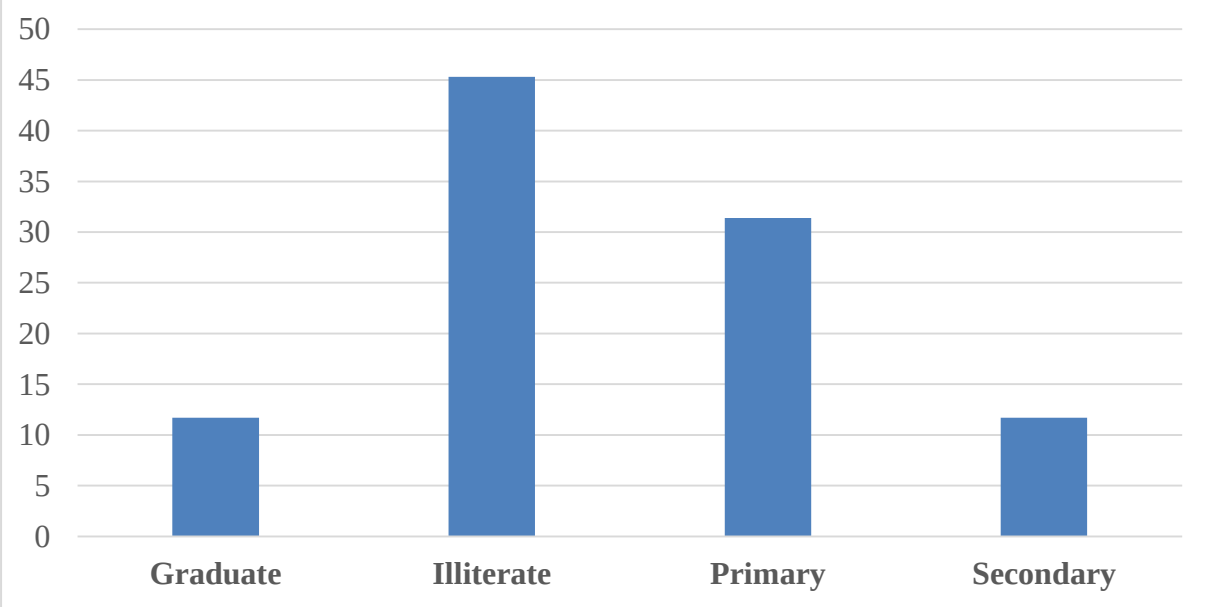


TABLE 3: DISTRIBUTION OF CASES ACCORDING TO OCCUPATION

OCCUPATION	NO. OF CASES	PERCENTAGE
Daily laborer	**85**	**62%**
Housewife	34	24.8%
Job	13	9.5%
Tailor	2	1.5%
Teacher	3	2.2%
Total	137	100%

In my study group most of the women were daily laborers 62% followed by housewives 24.8%, 9.5% were doing job and 2.2% were teacher with little knowledge about Pap smear and cervical cancers.

GRAPH 3: DISTRIBUTION OF CASES ACCORDING TO OCCUPATION

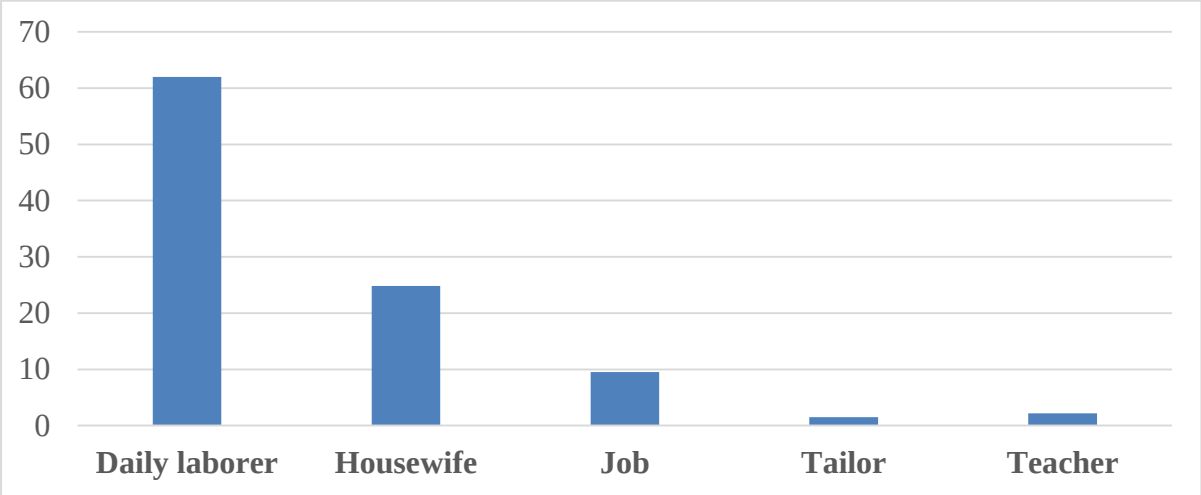


TABLE 4: DISTRIBUTION OF CASES ACCORDING TO SOCIOECONOMIC STATUS

SOCIOECONOMIC STATUS	NO. OF CASES	PERCENTAGE
Lower class	**77**	**56.2%**
Lower-middle class	21	15.3%
Middle class	19	13.9%
Upper class	16	11.7%
Upper middle class	4	2.9%
Total	137	100%

In my study group most of the women belonged to lower socio-economic status (56.2%) they constituted 77 of the total 137 women.

GRAPH 4: DISTRIBUTION OF CASES ACCORDING TO SOCIOECONOMIC STATUS

TABLE 5: DISTRIBUTION OF CASES ACCORDING TO AGE AT MARRIAGE

AGE (YEARS)	NO.OF CASES	PERCENTAGE
16-18	33	24.1%
19-21	**88**	**64.2%**
22-24	13	9.5%
25-27	3	2.2%
Total	137	100%

In my study group 88 (64.2%) of the women were married at the age of 19-21 years. 24.1% women were married at 16-18 years

GRAPH 5: DISTRIBUTION OF CASES ACCORDING TO AGE AT MARRIAGE

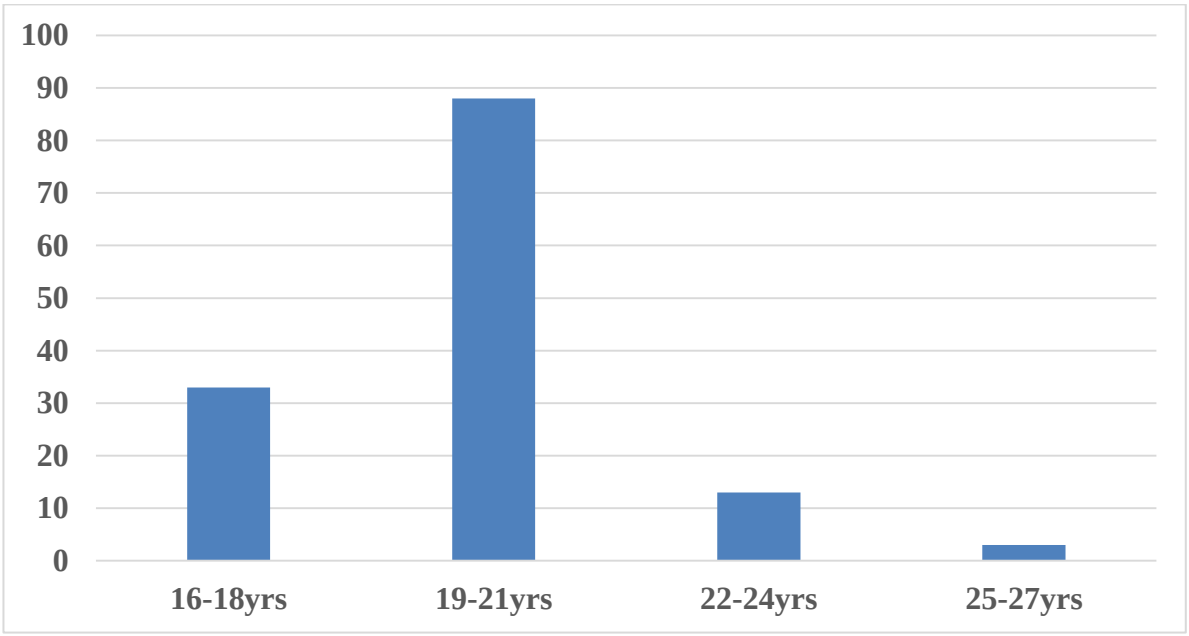


TABLE 6: DISTRIBUTION OF CASES ACCORDING TO PRIOR CONTRACEPTION USE

CONTRACEPTION	NO. OF CASES	PERCENTAGE
None	**72**	**52.6%**
Barrier	33	24.1%
IUCD	17	12.4%
OCP	15	10.9%
Total	137	100%

Total of 65 out of 137 women used contraception, of which most of them used barrier methods (33), followed by IUCD (17) and OC pills (15).

GRAPH 6: DISTRIBUTION OF CASES ACCORDING TO CONTRACEPTION USE

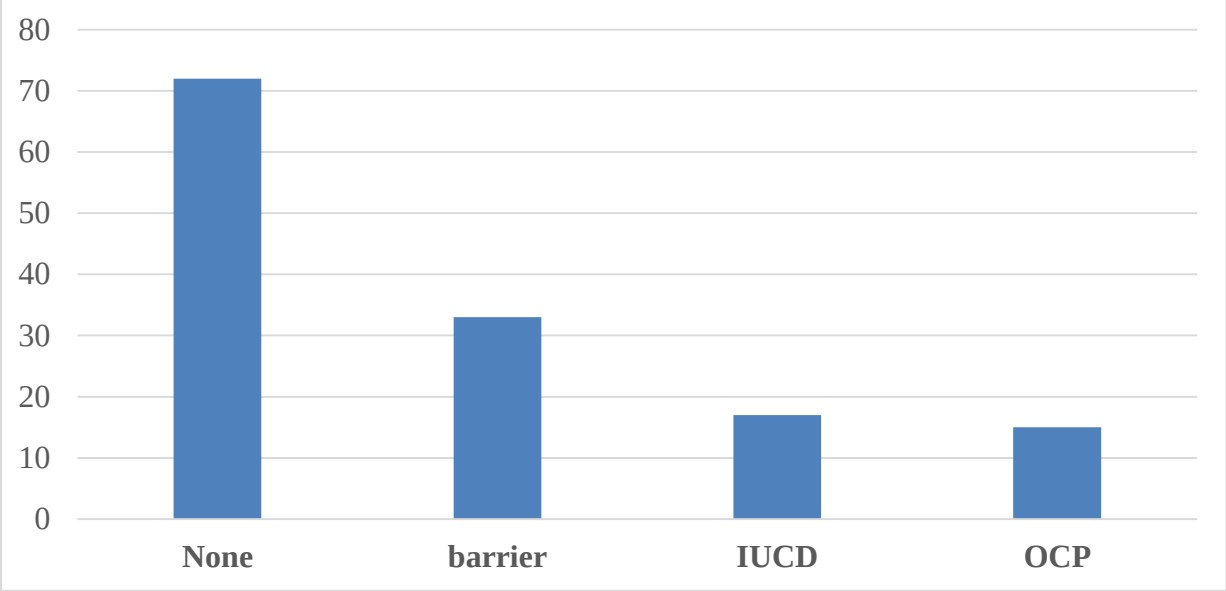


TABLE 7: DISTRIBUTION OF CASES ACCORDING TO AGE GROUPS

AGE GROUP (YEARS)	NO. OF CASES	PERCENTAGE
Below 18	1	0.73%
18 – 20	21	15.32%
21 – 23	**44**	**32.11%**
24 – 26	42	30.65%
27 – 29	14	10.21%
30 – 32	8	5.86%
33 – 35	7	5.12%
Total	137	100%

According to above table highest number of patients in my study group belongs to the age group of 21 – 23 years – 44 (32.11%) followed by age group 24-26 years and 15.32% in age group 18-20 years. Least number of patients was seen in age group below 18 years – 1 (0.73%). The oldest women in the study group were 35 years old.

The results suggest that there is an increased rate of certain STI's Pap smear abnormalities and pregnancies requiring antenatal care according to Doctors Reform society of Australia.

GRAPH 7: DISTRIBUTION OF CASES ACCORDING TO AGE GROUPS

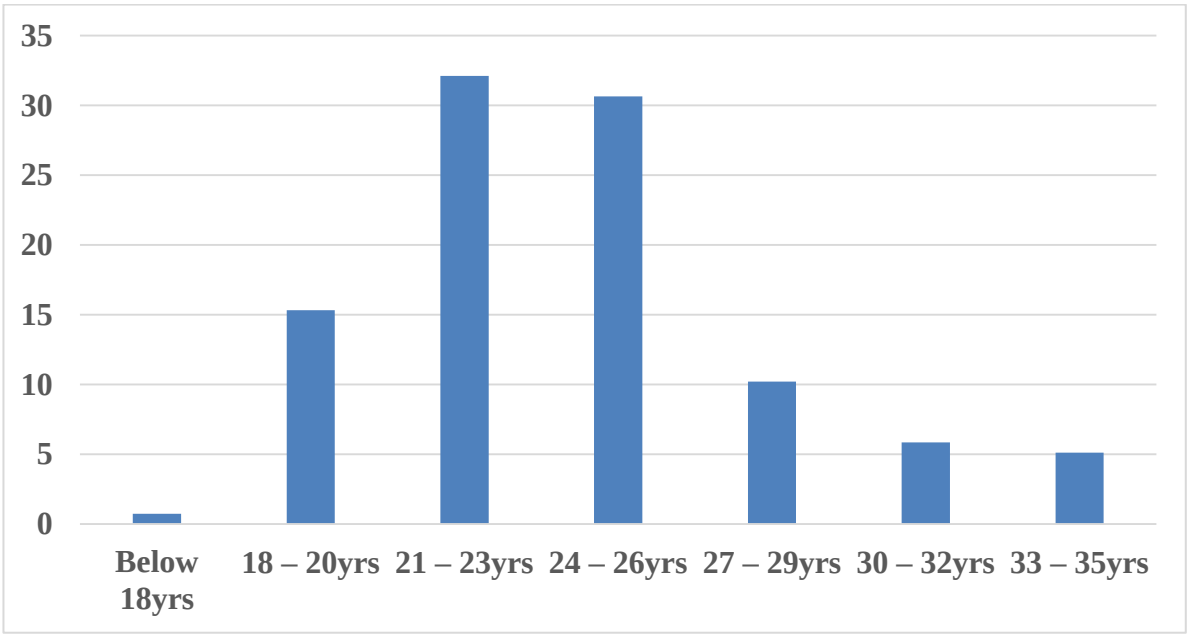


TABLE 8: DISTRIBUTION OF CASES ACCORDING TO PARITY

PARITY	NO. OF CASES	PERCENTAGE
Primigravida	**66**	**48.2%**
Gravida 2	39	28.5%
Gravida 3	19	13.9%
Gravida 4	8	5.8%
Gravida 5	3	2.2%
Gravida 6	2	1.5%
Total	137	100%

The above colum shows relationship of study group with parity. Among 137 cases 66 (48.2%) patients were primigravida, gravida 2 were 39 (28.5%), 19 (13.9%) were gravida 3, 8 (5.8%) were gravida 4, 3 (2.2%) were gravida 5, 2 (1.5%) were gravida 6.In this study maximum number of patients were primigravida (48.2%) and minimum number of patient were of gravida 6 (1.5%).

GRAPH 8: DISTRIBUTION OF CASES ACCORDING PARITY

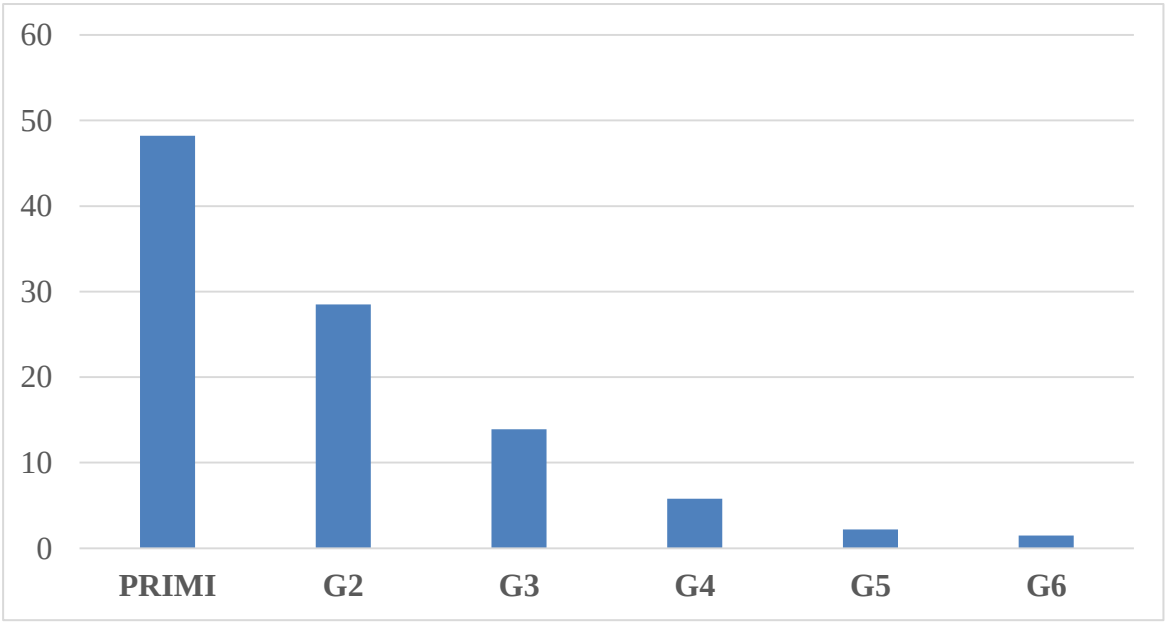


TABLE 9: DISTRIBUTION OF CASES ACCORDING TO PERIOD OF GESTATION

PERIOD OF GESTATION (WEEKS)	NO. OF CASES	PERCENTAGE
14-18	14	10.2%
19-23	9	6.6%
24-28	18	13.1%
29-33	22	16.1%
34-38	**54**	**39.4%**
Above 38	20	14.6%
Total	137	100%

In my study group most of the smears were taken during 34-38 weeks period of gestation 54 (39.4%) and at 29-33 weeks period of gestation, 22 (16.1%)

GRAPH 9: DISTRIBUTION OF CASES ACCORDING TO PERIOD OF GESTATION

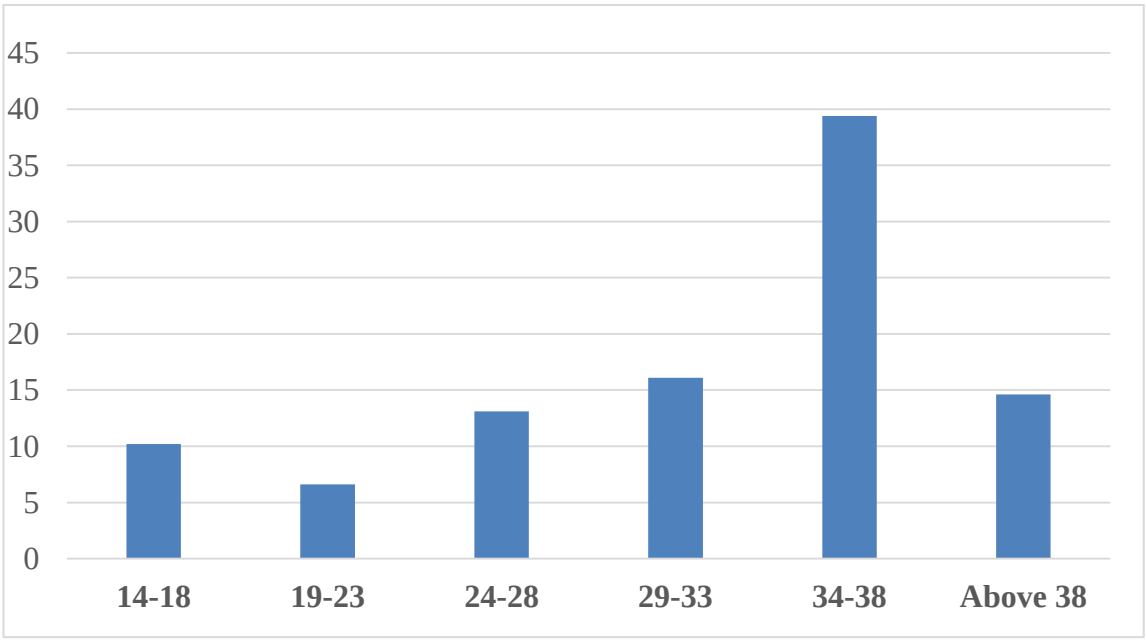


TABLE 10: DISTRIBUTION OF CASES IN RELATION TO MEAN AGE, PERIOD OF GESTATION AND AGE AT MARRIAGE.

PARAMETERS	n	MINIMUM	MAXIMUM	MEAN	SD
Age	137	17	35	**24.17**	3.9
Period of gestation	137	14	40	**31.8**	7.5
Age at Marriage	137	16	27	**19.66**	1.8

In my study group, the mean age is 24.17, period of gestation is 31.8, and mean age at marriage is 19.66

GRAPH 10: DISTRIBUTION OF CASES IN RELATION TO MEAN AGE, PERIOD OF GESTATION AND AGE AT MARRIAGE.

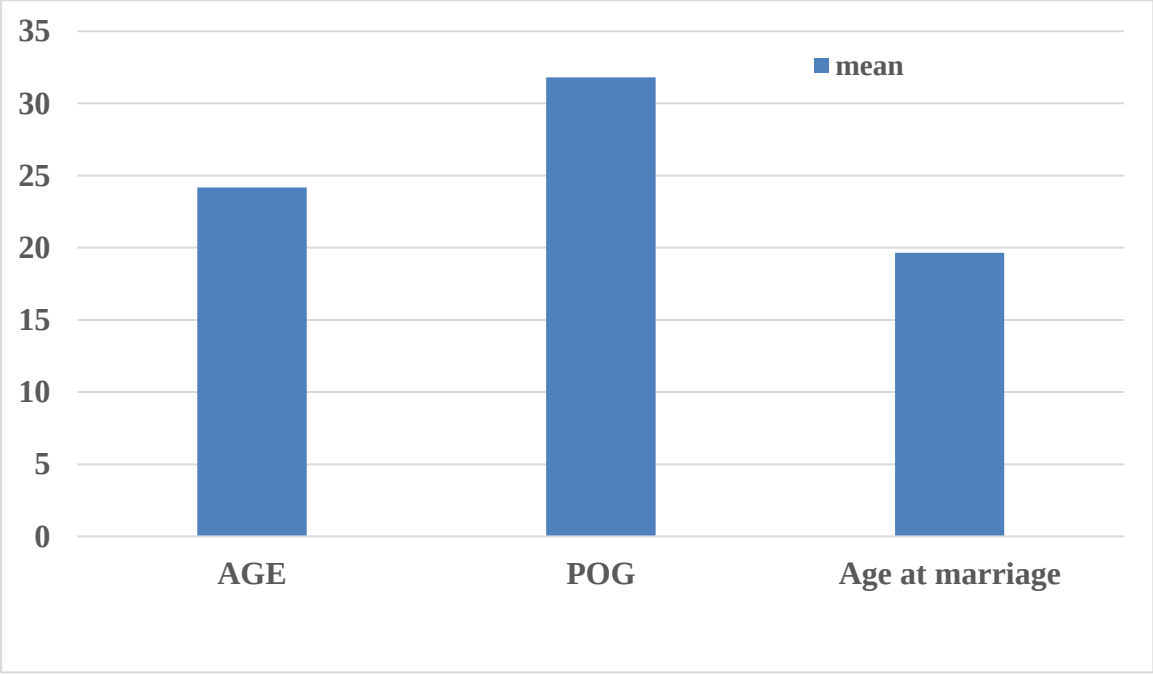


TABLE 11: APPEARANCE OF THE CERVIX ON SPECULUM EXAMINATION

PER SPECULUM EXAMINATION	NO. OF CASES	PERCENTAGE
Cervix and vagina healthy, curdy white discharge present	9	6.6%
Cervix and vagina healthy, minimal white discharge present	7	5.1%
Erosion	4	2.9%
Cervix and vagina healthy	**117**	**85.4%**
Total	137	100%

In my study group no growths were seen on visual examination of cervix. Most of the patients are having healthy cervix and vagina (85.4%). Erosion was seen in 2.9% of the cases. Minimal white discharge was seen in 5.1% and curdy white discharge present in 6.6% cases.

GRAPH 11: APPEARANCE OF THE CERVIX ON SPECULUM EXAMINATION

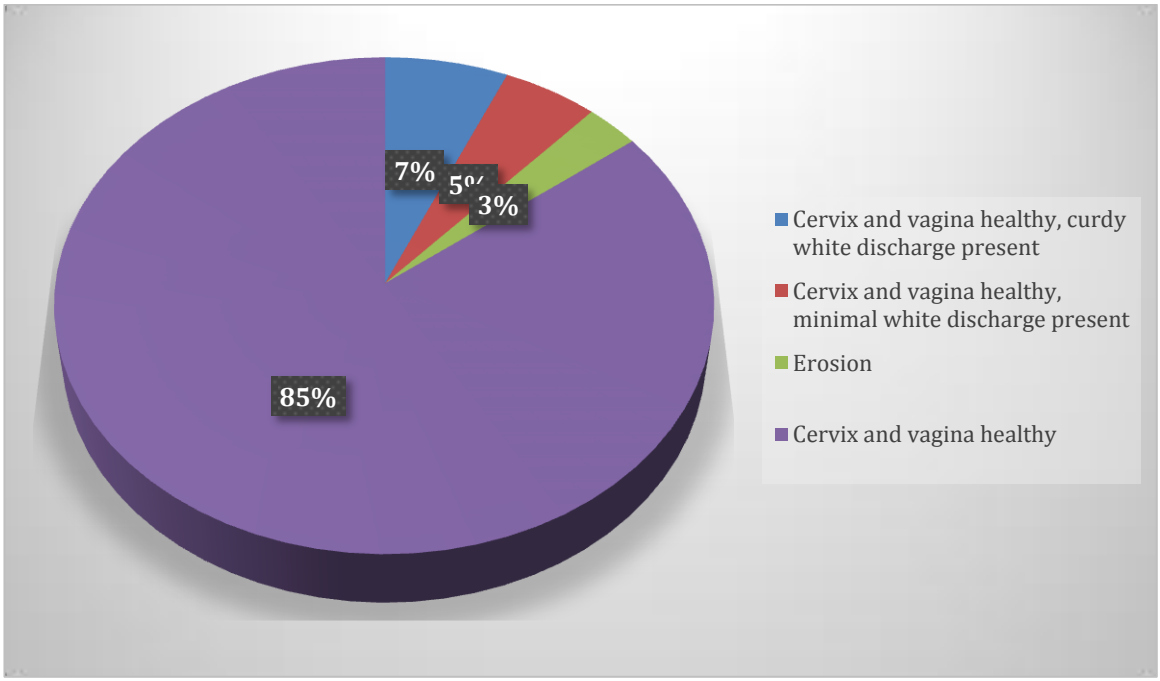


TABLE 12: DISTRIBUTION OF CASES ACCORDING TO CYTOLOGY REPORT

CYTOLOGY REPORT	NO. OF CASES	PERCENTAGE
NILM	**103**	**75.2%**
NILM with inflammatory smear	34	24.8%
Total	137	100%

(NILM: negative for intraepithelial lesion or malignancy)

In my study group most of the patients are having normal smear (75.2%). 34 women had inflammation (24.8%). None of the women showed abnormal smears in my study

GRAPH 12: DISTRIBUTION OF CASES ACCORDING TO CYTOLOGY REPORT

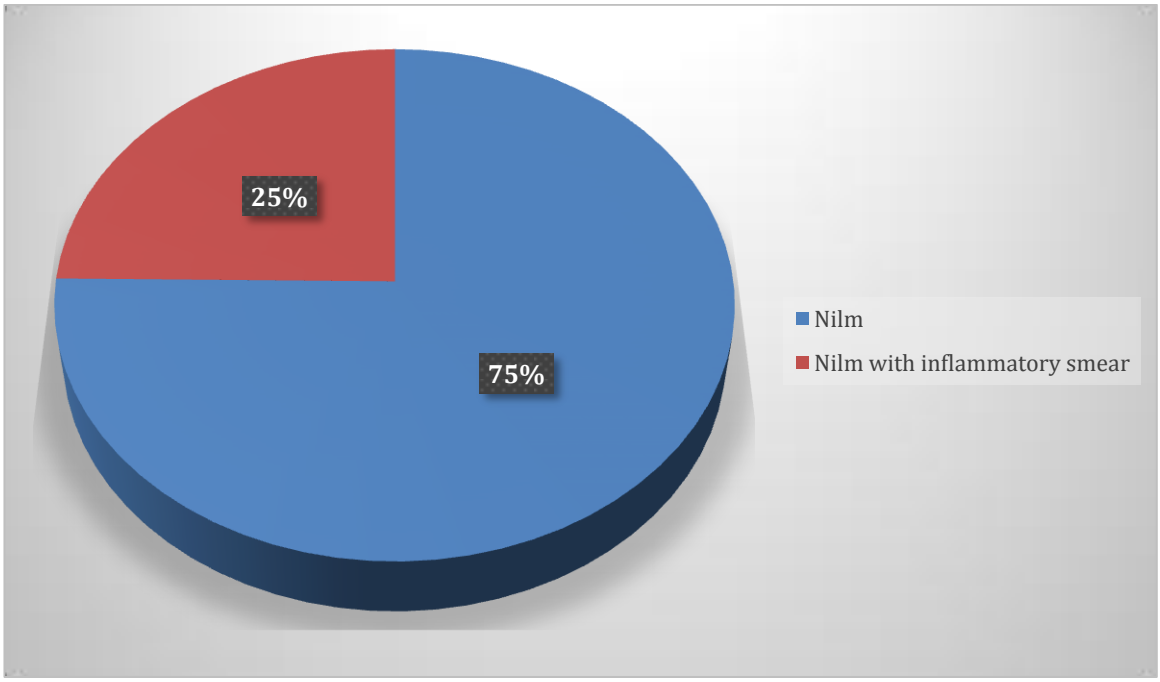


TABLE 13: DISTRIBUTION OF SMEARS IN PRIMIGRAVIDA AND MULTIGRAVIDA

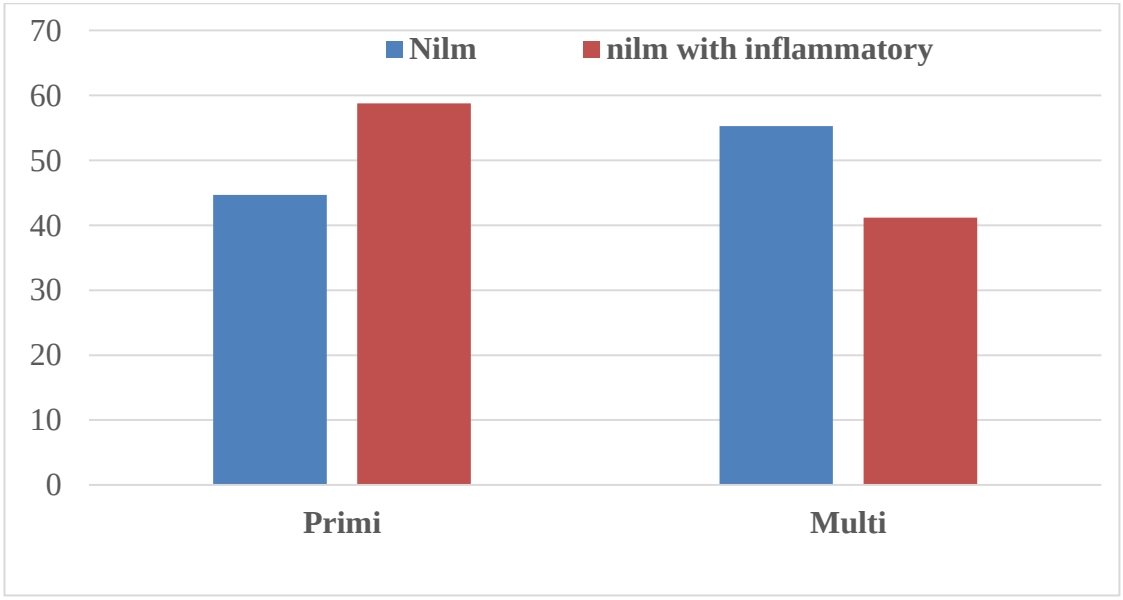
PARITY	CYTOLOGY REPORT		TOTAL
	NILM	NILM with inflammatory smear	
Primi	46	20	66
	44.7%	58.8%	48.2%
Multi	57	14	71
	55.3%	41.2%	51.8%
Total	103	34	137
	100.0%	100.0%	100.0%

Normal smears in primigravida were 46 accounting to 44.7% and multigravida were 57 accounting to 55.3%.

Inflammatory smears in primigravida were 20 accounting to 58.8% and in multigravida were 14 accounting to 41.2%.

P value = 0.153 which is not significant.

GRAPH 13: DISTRIBUTION OF CASES ACCORDING TO PARITY AND CYTOLOGY REPORT



DISCUSSION

Cancer cervix is both preventable and curable disease. It is preventable by cervical screening and curable if identified at an early stage. Screening cytology and early treatment constitute the sheet anchor of control of the disease. It is the third most common type of gynaecological cancer in women world wide. It accounts for 15% of all malignancies in developing countries where women do not have access to cervical cancer screening and prevention programs it remains the second most common type of cancer.

Indian contribution to cervical cases and mortality is 25.4% and 26.5% respectively. Majority of Indian women diagnosed with this disease have never been screened for this condition. Around 70% present in advanced stages due to absence of an organized cancer screening program.

Screening is essential because women often do not experience symptoms until the disease has advanced. Detection of CIN or precancerous lesions such as CIS (carcinoma insitu) leads to virtual cure with the availability of current methods of treatment.

The precancerous lesions cervical intraepithelial neoplasia (CIN), occurs along a spectrum of grades from low (CIN 1), moderate (CIN 2) to severe (CIN 3). Among these, CIN2, CIN3 require immediate treatment and follow-up. Untreated CIN3 generally progresses to invasive cancer. It takes 10-20 years of CIN to develop into invasive disease. Therefore, screening for precancerous lesions and early treatment is highly effective in preventing cervical cancer.

The main aim of my study is screening for cancer cervix to diagnose pre-invasive lesions and to detect cervical cancer before symptoms appear.

In spite of low rates of pre-invasive and invasive lesions in pregnant women, it may be beneficial for those who never had been examined before pregnancy, especially in India. Hence, I took the opportunity to screen pregnant women who attended antenatal OPD at RLJH, Kolar for antenatal checkup.

Among 137 antenatal women in my study group, 32.1% were in the age group 21-23 years followed by 30.65% were in age group 24-26 years, 0.73 % were in the teenage group

(below 18years). The results of my study were similar to study done by **Himabindu et al** [46] among 200 pregnant women in the study group, 46% were in the age group 18-20 years. 0.5% were 30-35 years, and 2% were in the teenage group 16-18 years.

Analysis of Risk Factors

In my study, out of 137 antenatal women, 93 women were not aware of Pap smear. 62 women were uneducated. 77 women belong to lower socioeconomic status. 85 women were daily laborer. 33 women had early marriages.72 women had not used any prior contraception. None of the patients had multiple sexual partners, nor gave history of exposure of spouse to extramarital relation

According to National Cancer Institute, strong risk factors include early age at first intercourse, history of multiple sexual partners, genital human papilloma virus infection (HPV) or other sexual transmitted disease (STD), and the presence or history of other genital tract abnormalities. One reason that many of these women do not get screened for cervical cancer is that they often don't view themselves as being at risk. Available literature shows that women often participate in cervical cancer screening less regularly, leading to lesions that are found in more advanced are less curable stage. Many women do not want to discuss sexual issues due to embarrassment despite appropriate counseling. About 24.1% (33 of 137 women) of the women had early marriages.

In my study the awareness of Pap smear is 32.1%, where as the study conducted by **Manikkam B,** [48] near Coimbatore, Tamilnadu, awareness was 80.5%. Since ours is a tertiary rural care center, the awareness of people residing in kolar regarding Pap smear was less accounting for 32.1%

In my study 24.8% showed inflammatory smear on cytological evaluation. All these women were further evaluated and treated appropriately.

Even though most of the women had strong risk factors like low socioeconomic status, uneducated, early marriages, none of the women showed abnormal smears in this study, could be due to most of the subjects were married above 18 years of age delaying their sexual debut, and majority of the cases were nullipara or primipara.

The results of my study were similar done by **Singh P, Baghel V,** [43] about 590 cases were screened during one year period and the mean age of the pregnant women under the study was 23.44+_ 3.96 years, most of whom were in the second trimester of gestation. 9.2% cases were younger than 20years of age and large proportion of 56.6% was between 20-24 years of age. None of the pap smears reported any intraepithelial lesion. Most of the subjects (74.6%) were married above 18 years of age delaying their sexual debut, and major proportion of the cases around 81% were nullipara or primipara having one full term normal delivery and that might be the probable reasons why abnormal Pap smear was not detected.

Most of the women in my study did not want to get a Pap smear done. They were not aware of routine and evidence based screening for cervical cancer. Women were not forthcoming about their sexual history. Many women did not want to discuss sexual issues due to embarrassment, denial or lack of rapport despite appropriate counseling. Most of the women studied were unwilling for a repeat pap smear.

SUMMARY

A Total of 137 antenatal women fulfilling inclusion criteria, who have visited to OPD of Department of Obstetrics and Gynecology at R.L. Jalappa Hospital and Research Centre constituent of Sri Devaraj Urs Medical College, Tamaka, Kolar, from January 2016 to June 2017 were studied in my study.

- In my study most of the pregnant women that is 93(67.9%) out of 137 were not aware of Pap smear.
- Most the patients were uneducated (45.3%) and 31.4% of the women received education up to primary school followed by secondary school education in 11.7% and 11.7% were graduates. Women who were graduates were aware of screening tests for cancer cervix.
- 62% of patients were daily laborers followed by housewives 24.8%, 9.5% were doing job and 2.2% were teacher with little knowledge about Pap smear and cervical cancers.
- Most of the women belonged to lower socio-economic status (56.2%) they constituted 77 of the total 137 women.
- 88 (64.2%) of the women were married at the age of 19-21 years. 24.1% women were married at 16-18 years
- Total of 65 out of 137 women used contraception, of which most of them used barrier methods (33), followed by IUCD (17) and OC pills (15).
- Highest number of patients in the study group belongs to the age group of 21 – 23 years – 44 (32.11%) followed by age group 24-26 years and 15.32% in age group 18-20 years. Least number of patients was seen in age group below 18 years – 1 (0.73%). The oldest women in the study group were 35 years old.
- Maximum numbers of patients were primigravida (48.2%)
- Most of the smears were taken during 34-38 weeks period of gestation 54 (39.4%) and at 29-33 weeks period of gestation, 22 (16.1%)
- The mean age is 24.17, period of gestation is 31.8, and mean age at marriage is 19.66
- No growths were seen on visual examination of cervix. Most of the patients are having healthy cervix and vagina (85.4%). Erosion was seen in 2.9% of the cases. Minimal white discharge was seen in 5.1% and curdy white discharge present in 6.6% cases.
- None of the women showed abnormal smears in my study

- Normal smears in primigravida were 46 accounting to 44.7% and multigravida were 57 accounting to 55.3%. Inflammatory smears in primigravida were 20 accounting to 58.8% and in multigravida were 14 accounting to 41.2%. **P value = 0.153** which is not significant.

CONCLUSION

Carcinoma cervix is one of the deadly cause of mortality due to gynaecological cancer in India.

The aim of my study was to detect pre-invasive and invasive lesions of the cervix in woman who came for antenatal checkup.

Even though there were no positive smears, 34 smeared patients had inflammatory smear. Those detected to have inflammatory smears were treated appropriately.

This interaction with patient sensitized them to the need for cervical cancer screening in future.

Since most of the patients visiting our facility are from the rural area many only seek medical care during pregnancy and hence educating and creating awareness regarding cervical cancer screening among them during pregnancy is helpful in this area.

For all the above mentioned reasons it is justified and highly recommendable to take Pap smear during antenatal period.

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ANNEXURES

PROFORMA

NAME: IP NO:

AGE: DOE:

OCCUPATION:

ADDRESS:

EDUCATION:

HUSBANDS OCCUPATION:

SOCIOECONOMIC STATUS:

CHIEF COMPLAINTS:

HISTORY OF PRESENT ILLNESS:

OBSTETRIC HISTORY:

Marital life: Consanguinity:

Gravida: Para: living: Abortion: Dead:

Details of previous pregnancy:

Details of present pregnancy:

MENSTRUAL HISTORY:

Last menstrual period: Age of menarche:

Expected delivery date:

Period of gestation:

Period of gestation according to early scan:

Past menstrual cycles:

PAST HISTORY:

HTN/DM/BA/TB/BLOOD DYSCRASIAS/EPILEPSY/THYROID DISORDER/CARDIAC DISEASE

H/O blood transfusions:

H/O Surgeries or hospitalization:

PERSONAL HISTORY:

Sleep and appetite:

Diet:

Bowel and bladder:

FAMILY HISTORY:

DRUG HISTORY:

GENERAL EXAMINATION:

General condition: Fair/ moderate/ Poor

Built: Nourishment:

Ht: cms Wt: kgs BMI:

Pallor: Icterus:

Cyanosis: Clubbing:

Lymphadenopathy: Edema:

VITALS:

Pulse rate:

Respiratory rate:

Blood pressure:

Temperature:

SYSTEMIC EXAMINATION:

Cardiovascular system:

Respiratory system:

Central nervous system:

Per abdomen: Uterus size:

Relaxed / Irritable / Acting

Presentation: cephalic/ Breech/ other

FHS:

LOCAL EXAMINATION:

Per speculum:

Per vaginum: Effacement:

Dilatation:

Station:

Membranes:

Pelvis:

PROVISIONAL DIAGNOSIS:

INVESTIGATIONS:

Blood group and Rh typing:

CBC: HB: HIV:

PCV: HbsAG:

RBC: VDRL:

WBC:

PLT:

RBS:

Urine analysis: Albumin-

Sugar-

Microscopy-

OBSTETRICS SCAN:

Pap smear report:

SRI DEVARAJ URS MEDICAL COLLEGE & RESEARCH CENTRE, TAMAKA, KOLAR

PATIENT CONSENT FORM

Case no:

I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it and any questions that I have asked have been answered to my satisfaction. I have understood that I have the right to refuse consent or withdraw it at any time during the study and this will not affect my treatment in any way. I consent voluntarily to participate in this study "A STUDY TO DETECT PREINVASIVE & INVASIVE CANCER OF CERVIX DURING PREGNANCY BY USING PAP SMEAR"

Name of Participant_____

Signature/ thumb print of Participant _____

Date _____

Statement by the researcher/person taking consent:

I have accurately read out the information sheet to the potential participant, and to the best of my ability made sure that the participant understands that the following will be done:

1. Pap smear will be taken from the patient to detect preinvasive & invasive cancer of cervix during pregnancy.

I confirm that the participant was given an opportunity to ask questions about the study, and all the questions asked by the participant have been answered correctly and to the best of my ability. I confirm that the individual has not been coerced into giving consent, and the consent has been given freely and voluntarily.

Name of Researcher/person taking the consent_____

Signature of Researcher /person taking the consent_____

Date _____

Name and Address of Principal Investigator: Dr. Sai Pujitha Kurra
R.L Jalappa Hospital
Tamaka, Kolar.

KANNADA CONSENT FORM

ಮಾಹಿತಿಯುಕ್ತ ಸಮ್ಮತಿಯ ನಮೂನೆ

ಇದು ಸೂಕ್ತ ಪೂರ್ವಸೂಚಕ ಅಂಶಗಳಲ್ಲಿ ಜ್ಞಾನ ತೀವ್ರ ನಿಗಾ ಚಿಕಿತ್ಸೆಯ ಅಗತ್ಯ ಹೆಚ್ಚಿನ ಅಪಾಯ ರೋಗಿಗಳ ಆರಂಭಿಕ ಗುರುತಿನ ಉಪಯುಕ್ತ ಇರಬಹುದು ಭರವಸೆಯಿದೆ . ನೀವು ಅಧ್ಯಯನದಲ್ಲಿ ಭಾಗವಹಿಸಲು ಒಪ್ಪುತ್ತೀರಿ ವೇಳೆ ನೀವು ಅಥವಾ ನೀವು ಅಥವಾ ಎರಡೂ ಜವಾಬ್ದಾರಿ ವ್ಯಕ್ತಿಯಿಂದ ಮಾಹಿತಿ (ಪ್ರತಿ PROFORMA ಮಾಹಿತಿ) ಸಂಗ್ರಹಿಸುತ್ತದೆ . ನಿಮ್ಮ ಆಸ್ಪತ್ರೆ ದಾಖಲೆಯಿಂದ ಚಿಕಿತ್ಸೆ ಮತ್ತು ಸೂಕ್ತ ವಿವರಗಳನ್ನು ಸಂಗ್ರಹಿಸುತ್ತದೆ . ಸಂಗ್ರಹಿಸಿದ ಈ ಮಾಹಿತಿ ಮಾತ್ರ ಪ್ರೌಢಪ್ರಬಂಧದಲ್ಲಿ ಮತ್ತು ಪ್ರಕಟಣೆ ಬಳಸಲಾಗುತ್ತದೆ . ಈ ಅಧ್ಯಯನವು ಸಾಂಸ್ಥಿಕ ನೈತಿಕ ಸಮಿತಿಯು ವಿಮರ್ಶಿಸುತ್ತದೆ ಮಾಡಲಾಗಿದೆ . ನೀವು ಭಾಗವಹಿಸಲು ಇಚ್ಛಿಸದಿದ್ದರೆ ನೀವು ಪಡೆಯುತ್ತಾನೆ ಆರೈಕೆ ಬದಲಾಗುವುದಿಲ್ಲ . ನೀವು ಸ್ವಯಂಪ್ರೇರಣೆಯಿಂದ ಈ ಅಧ್ಯಯನದಲ್ಲಿ ಭಾಗವಹಿಸಲು ಒಪ್ಪಿಕೊಂಡಲ್ಲಿ ಹೆಬ್ಬೆಟ್ಟಿನ ಗುರುತು ಸೈನ್ / ಒದಗಿಸುವ ಅಗತ್ಯವಿದೆ .

ನಾನು ಯಾವುದೇ ಸಮಯದಲ್ಲಿ ಅಧ್ಯಯನದಿಂದ ಹಿಂತೆಗೆದುಕೊಳ್ಳುವಂತೆ ಮತ್ತು ಈ ನನ್ನ ಮುಂದಿನ ಆರೈಕೆ ಬದಲಾಗುವುದಿಲ್ಲ ಉಚಿತ ಉಳಿಯಲು ಎಂದು ಅರ್ಥ . ನಾನು ಓದಲು ಅಥವಾ ನನಗೆ ಓದಲು ಮಾಡಲಾಗಿದೆ ಮತ್ತು ಅಧ್ಯಯನದ ಉದ್ದೇಶ , ಬಳಸಲಾಗುವ ವಿಧಾನ , ಅಧ್ಯಯನ ಮತ್ತು ಅಧ್ಯಯನದ ಸಮಯದಲ್ಲಿ ಸಂಗ್ರಹಿಸಿದ ಮತ್ತು ಬಹಿರಂಗ ನಡೆಯಲಿದೆ ಮಾಹಿತಿಯನ್ನು ಪ್ರಕೃತಿಯಲ್ಲಿ ನನ್ನ ಒಳಗೊಳ್ಳುವಿಕೆ ಸಂಬಂಧಿಸಿದ ಅಪಾಯ ಮತ್ತು ಲಾಭಗಳನ್ನು ಅರ್ಥ . ನಾನು ಅಧ್ಯಯನ ಮತ್ತು ನನ್ನ ಪ್ರಶ್ನೆಗಳಿಗೆ ವಿವಿಧ ಅಂಶಗಳನ್ನು ನನ್ನ ತೃಪ್ತಿ ಉತ್ತರಿಸುವ ಬಗ್ಗೆ ನನ್ನ ಪ್ರಶ್ನೆಗಳನ್ನು ಕೇಳಲು ಅವಕಾಶ ಹೊಂದಿದ್ದರು . ನಾನು , ಈ ಅಧ್ಯಯನದಲ್ಲಿ ಭಾಗವಹಿಸಲು ಮತ್ತು ಪ್ರೌಢಪ್ರಬಂಧದಲ್ಲಿ ನನ್ನ ವೈಯಕ್ತಿಕ ಮಾಹಿತಿಯ ಸಂಗ್ರಹಣೆ ಮತ್ತು ಡಿಸ್ಕ್ಲೋಸರ್ ಅಧಿಕೃತಗೊಳಿಸಲು ಒಪ್ಪುತ್ತೀರಿ ರುಜುಮಾಡಿರುವ .

ವಿಷಯದ ಹೆಸರು

(ಪಾಲಕರು / ಗಾರ್ಡಿಯನ್ಸ್ ಹೆಸರು)

DATE : ಸಹಿ / ಹೆಬ್ಬೆಟ್ಟಿನ ಗುರುತು

ಒಪ್ಪಿಗೆ ತೆಗೆದುಕೊಳ್ಳುವ ವ್ಯಕ್ತಿಯ ಹೆಸರು ಮತ್ತು ಸಹಿ

KEY TO MASTER CHART

Hosp. no	Hospital number
Primi	primigravida
GA	Gestational age
Knowledge of Pap smear	A - aware
	NA – not aware
NILM	Negative for intraepithelial lesion or maliQgnancy
IUCD	Intrauterine contraceptive device
OCP	Oral contraceptive pills

hosp.no	name	age(years)	gravida	GA(weeks)	perspeculum examination	cytology report	age at marriage(years)	knowledge(A - aware, NA-not aware)	education	occupation	socioeconomic status	contraception
360974	pushpa	26	g3p1l1a1	16	cervix and vagina	nilm	21	A	primary	housewife	lower-middle class	
360947	saritha	30	g3p1l1a1	26	cervix and vagina	nilm	20	NA	primary	daily labourer	lower class	ocp
282426	sowbhagya	28	g2p1l1	18	cervix and vagina	nilm	22	A	secondary	housewife	middle class	barrier
361119	asmataj	30	g3p2l2	39	cervix and vagina	nilm	20	NA	primary	daily labourer	lower-middle class	
361180	rabiya	23	primi	30	cervix and vagina	nilm	22	A	graduate	teacher	upper class	barrier
317956	raziya sulthana	29	g4p1l1a2	38	cervix and vagina	nilm	19	NA	primary	daily labourer	lower class	barrier
311978	afshan roohie	25	primi	38	cervix and vagina healthy, minimal	nilm with inflammatory smear	21	A	primary	housewife	middle class	barrier
362387	farheen	20	primi	20	cervix and vagina	nilm	18	NA	uneducated	daily labourer	lower class	
362545	shylaja	24	primi	36	cervix and vagina	nilm	20	A	primary	housewife	middle class	
361293	shilpa	24	g3p2l1d1	28	cervix and vagina	nilm	17	NA	primary	daily labourer	lower-middle class	
363767	mamatha	26	g2p1l1	40	cervix and vagina	nilm	21	A	primary	housewife	lower-middle class	barrier
353865	fathima zahera	21	g3p2l1d1	22	cervix and vagina	nilm	16	NA	primary	daily labourer	lower class	
363749	fareeha sulthana	25	primi	17	cervix and vagina	nilm	20	NA	primary	daily labourer	lower class	
363852	ume habiba	28	g2p1l1	37	cervix and vagina	nilm	21	A	primary	tailor	middle class	barrier
363877	pushpa	22	primi	36	cervix and vagina	nilm	19	NA	primary	daily labourer	lower class	
365030	ayesha begum	27	g4p3l2d1	39	cervix and vagina	nilm with inflammatory	18	NA	primary	daily labourer	lower class	IUCD
365125	radha	24	g3a1e1	40	cervix and vagina	nilm	20	A	primary	housewife	middle class	
365207	hemavathi	35	g3p2l2	39	cervix and vagina	nilm	20	NA	primary	daily labourer	lower-middle class	ocp
365129	mubashira	30	g4p2l2a1	20	cervix and vagina	nilm	17	NA	uneducated	daily labourer	lower class	IUCD
365199	farhana	27	g2p1l1	33	cervix and vagina	nilm	24	A	graduate	job	upper class	barrier
326311	meena	20	g3p1l1a1	32	erosion	nilm	16	NA	primary	daily labourer	lower class	
366386	mamatha	32	g2p1l1	28	cervix and vagina	nilm	21	NA	primary	daily labourer	lower class	ocp
354382	amreen	22	g2a1	14	cervix and vagina	nilm	19	A	secondary	housewife	lower-middle class	barrier
367583	shantha	28	g2p1l1	18	cervix and vagina	nilm	20	NA	primary	daily labourer	lower class	IUCD
367740	chaithra	24	g2p1l1	15	cervix and vagina	nilm	21	NA	primary	daily labourer	lower class	ocp
366207	hemavathi	21	primi	14	cervix and vagina	nilm	21	A	graduate	job	upper class	barrier
172611	pooja	21	primi	32	cervix and vagina	nilm with inflammatory	18	NA	primary	daily labourer	lower class	
370599	rupa	23	primi	37	cervix and vagina	nilm	20	NA	primary	daily labourer	lower class	
322082	swetha	25	primi	37	cervix and vagina	nilm	23	A	graduate	teacher	upper class	barrier
358728	roopa	22	g2p1l1	38	cervix and vagina	nilm	18	NA	primary	daily labourer	lower class	IUCD
370685	ashwini	22	g2a1	38	cervix and vagina healthy, minimal	nilm with inflammatory smear	17	NA	primary	daily labourer	lower-middle class	
366721	sujatha	33	g2p1l1	38	cervix and vagina	nilm	20	A	secondary	housewife	middle class	ocp
370853	veena	24	g2p1l1	20	cervix and vagina	nilm	20	NA	primary	daily labourer	lower-middle class	barrier
370849	sowmya	28	primi	27	cervix and vagina	nilm	19	A	primary	daily labourer	middle class	
370874	farhina taj	17	primi	35	cervix and vagina	nilm	16	NA	uneducated	housewife	lower class	
370875	tabassum taj	19	primi	39	cervix and vagina	nilm	16	NA	uneducated	daily labourer	lower class	
366991	zoya fathima	21	g3p1l1a1	17	erosion	nilm	18	A	graduate	job	upper class	barrier
343108	nandini	35	g6p1l1a4	16	cervix and vagina	nilm with inflammatory	19	NA	uneducated	housewife	lower class	

306221	pushpavathi	25	g2p1d1	35	cervix and vagina	nilm with inflammatory	20	NA	primary	daily labourer	lower class	ocp
371706	mamatha	22	g2p1l1	37	cervix and vagina	nilm	17	A	secondary	housewife	middle class	barrier
371829	taheera	22	primi	31	cervix and vagina	nilm	20	NA	primary	daily labourer	lower-middle class	
366977	arathi	29	g4p2l1d1a1	14	cervix and vagina	nilm	22	A	graduate	job	upper class	barrier
244194	ganga bhavani	23	g2p1l1	25	cervix and vagina	nilm with inflammatory	19	NA	primary	daily labourer	lower class	IUCD
246650	ashwini	24	primi	40	cervix and vagina	nilm with inflammatory	21	A	primary	tailor	middle class	
15543	richana	20	g2p1l1	34	cervix and vagina healthy, minimal	nilm with inflammatory smear	17	A	secondary	housewife	middle class	barrier
249106	tabassum	25	g4p3l1d2	33	cervix and vagina	nilm with inflammatory	18	NA	uneducated	daily labourer	lower class	
90310	lakshmi devi	27	g2a1	23	cervix and vagina	nilm with inflammatory	19	NA	uneducated	daily labourer	lower class	ocp
249126	anitha	24	primi	36	cervix and vagina	nilm with inflammatory	21	NA	uneducated	daily labourer	lower class	
249150	asma taj	24	g3p2l1d1	38	cervix and vagina	nilm	20	A	graduate	job	upper class	barrier
219183	naziya taj	25	g5p3l2d1a1	29	cervix and vagina	nilm	19	NA	uneducated	daily labourer	lower class	IUCD
2434057	arshiya	22	g2a1	25	cervix and vagina	nilm	19	A	secondary	housewife	middle class	
290188	shiva shakthi	22	g2p1l1	38	cervix and vagina	nilm	20	NA	uneducated	daily labourer	lower class	IUCD
264570	lavanya	20	primi	18	cervix and vagina	nilm	18	NA	uneducated	daily labourer	lower class	
279338	shilpa	23	primi	37	cervix and vagina	nilm	21	NA	uneducated	daily labourer	lower class	
261711	kusuma	22	primi	37	cervix and vagina	nilm	20	NA	uneducated	daily labourer	lower class	
261914	meena	21	primi	38	cervix and vagina	nilm	19	A	primary	housewife	middle class	
261960	bharathi	28	primi	40	cervix and vagina	nilm with inflammatory	21	NA	primary	daily labourer	lower class	ocp
264250	shilpa rani	25	primi	37	cervix and vagina	nilm with inflammatory	20	A	secondary	housewife	middle class	barrier
236794	gayathri	23	g2p1d1	34	cervix and vagina	nilm with inflammatory	20	NA	primary	daily labourer	lower class	
265447	narasamma	20	primi	34	cervix and vagina	nilm with inflammatory	17	NA	uneducated	daily labourer	lower class	
265458	shwetha	24	primi	38	cervix and vagina	nilm	20	NA	uneducated	daily labourer	lower class	
265455	mala	24	g3p1l1a1	28	cervix and vagina	nilm	21	A	primary	housewife	lower-middle class	IUCD
266086	jahnavi	22	primi	37	cervix and vagina	nilm with inflammatory	19	NA	uneducated	daily labourer	lower class	
262043	fathima	26	primi	35	cervix and vagina	nilm with inflammatory	24	A	graduate	job	upper class	barrier
262024	lakshmi	20	primi	36	cervix and vagina	nilm	18	NA	uneducated	daily labourer	lower class	
264256	shilpa	25	primi	37	cervix and vagina	nilm with inflammatory	22	A	primary	housewife	middle class	barrier
270513	anjum taj	18	primi	24	cervix and vagina	nilm	16	NA	uneducated	daily labourer	lower class	
271962	shabana taj	26	g2p1l1	29	cervix and vagina	nilm with inflammatory	22	A	primary	housewife	lower-middle class	barrier
274487	vinodha	22	g2p1l1	25	cervix and vagina	nilm	19	NA	uneducated	daily labourer	lower class	IUCD
275291	nagamma	25	g2p1l1	26	cervix and vagina	nilm	22	NA	uneducated	daily labourer	lower class	
276613	sudha	27	primi	40	cervix and vagina	nilm with inflammatory	25	A	graduate	job	upper class	barrier
274489	aisha	20	primi	36	cervix and vagina	nilm with inflammatory	19	A	secondary	housewife	upper middle class	
283557	renuka	24	primi	30	cervix and vagina	nilm	21	NA	uneducated	daily labourer	lower class	
297610	rabiya khanum	18	primi	38	cervix and vagina	nilm	17	NA	uneducated	daily labourer	lower class	
292980	shilpa	21	primi	39	cervix and vagina	nilm with inflammatory	20	NA	uneducated	daily labourer	lower class	
261129	bhulakshmamma	32	g5p3l2d1a1	22	cervix and vagina	nilm	19	NA	uneducated	daily labourer	lower class	IUCD
254522	shyamalamma	35	primi	20	cervix and vagina healthy, minimal	nilm	25	A	graduate	job	upper class	barrier
233034	aruna	20	primi	22	cervix and vagina	nilm	18	NA	primary	daily labourer	lower-middle class	
237114	sudhamayee	18	primi	15	cervix and vagina	nilm	17	NA	primary	daily labourer	lower class	
243438	latha	22	g2a1	22	cervix and vagina	nilm	20	A	secondary	housewife	middle class	

245703	kavitha	25	g2p1l1	28	cervix and vagina	nilm	20	NA	primary	daily labourer	lower class	barrier
247076	kumari	24	primi	36	cervix and vagina	nilm	21	NA	uneducated	daily labourer	lower class	
257153	zareena	26	g2p1d1	16	cervix and vagina	nilm	20	NA	uneducated	daily labourer	lower class	IUCD
261129	ayesha khan	22	g2a1	18	cervix and vagina	nilm	21	NA	uneducated	daily labourer	lower-middle class	
261091	nirmala	24	g3a2	33	cervix and vagina	nilm	19	NA	uneducated	housewife	lower class	ocp
275922	asma begum	23	g2p1l1	32	cervix and vagina	nilm with inflammatory	19	A	secondary	housewife	upper middle class	barrier
207976	gopalamma	21	primi	25	cervix and vagina	nilm	20	NA	uneducated	daily labourer	lower class	
207434	shanthi	20	primi	28	cervix and vagina	nilm	18	NA	uneducated	daily labourer	lower class	
208242	karuna	28	g3p1l1a1	30	cervix and vagina	nilm	20	NA	uneducated	daily labourer	lower class	IUCD
208810	amreen taj	29	g4p2l2a1	32	cervix and vagina healthy, minimal	nilm with inflammatory smear	19	NA	uneducated	daily labourer	lower class	IUCD
336288	chinnapillamma	30	g3p2l2	34	cervix and vagina	nilm	20	NA	uneducated	housewife	lower class	IUCD
359735	supriya	21	primi	38	cervix and vagina	nilm	19	A	secondary	housewife	middle class	barrier
336588	nagamani	22	primi	30	cervix and vagina	nilm	20	NA	primary	daily labourer	lower-middle class	
368201	geethamma	22	primi	31	cervix and vagina	nilm with inflammatory	19	NA	uneducated	daily labourer	lower class	
301989	krusheeda	20	g2a1	28	cervix and vagina	nilm	18	A	secondary	housewife	upper middle class	
366977	chaitra	25	primi	38	cervix and vagina	nilm	19	NA	uneducated	daily labourer	lower class	
373742	jyothi	20	g2a1	28	cervix and vagina	nilm	18	NA	uneducated	daily labourer	lower class	
373823	madhubai	20	primi	32	cervix and vagina	nilm	19	NA	primary	housewife	lower-middle class	
374019	munirathna	35	g2p1d1	36	cervix and vagina	nilm	20	NA	uneducated	daily labourer	lower class	ocp
374357	sunitha	22	primi	38	cervix and vagina	nilm	20	NA	uneducated	daily labourer	lower class	
377030	radhamani	20	g2a1	30	cervix and vagina	nilm	18	NA	uneducated	daily labourer	lower class	
378932	padma	25	g2a1	37	cervix and vagina	nilm	20	NA	uneducated	daily labourer	lower class	
379404	lakshmi devi	22	primi	36	cervix and vagina	nilm	20	A	secondary	housewife	middle class	barrier
366207	hemavathi	21	primi	30	cervix and vagina	nilm with inflammatory	19	NA	uneducated	daily labourer	lower class	
172611	pooja	26	g3p1l1a1	39	cervix and vagina	nilm	20	NA	uneducated	daily labourer	lower class	IUCD
370599	rupa	22	primi	33	cervix and vagina	nilm	19	NA	uneducated	daily labourer	lower class	
301925	vanaja	21	primi	37	cervix and vagina healthy, minimal	nilm with inflammatory smear	19	A	secondary	housewife	middle class	barrier
387563	rajitha	23	primi	36	cervix and vagina	nilm	20	NA	uneducated	daily labourer	lower class	
399163	aruna	22	primi	37	cervix and vagina	nilm	20	NA	uneducated	daily labourer	lower class	
398294	kalavathi	25	primi	32	cervix and vagina	nilm	23	A	graduate	job	upper class	barrier
399147	salma kousar	29	g6p4l2d2a1	26	erosion	nilm	19	NA	uneducated	daily labourer	lower class	
398321	umavathi	35	g3p2l2	37	cervix and vagina	nilm	20	NA	uneducated	daily labourer	lower class	IUCD
393566	suvarna	26	g4p1l1d1	36	cervix and vagina	nilm with inflammatory	20	NA	uneducated	daily labourer	lower class	
396288	amulya	25	g2p1l1	37	cervix and vagina	nilm	21	A	graduate	teacher	upper class	barrier
399441	bhagya	23	primi	38	cervix and vagina	nilm	21	NA	uneducated	daily labourer	lower class	
399497	vanaja	22	primi	38	cervix and vagina	nilm with inflammatory	20	NA	uneducated	daily labourer	lower-middle class	
399359	anusha	24	primi	38	cervix and vagina	nilm	20	NA	uneducated	daily labourer	lower class	
397408	mamatha	24	primi	39	cervix and vagina	nilm	21	A	graduate	job	upper class	barrier
399561	shamala	21	g2p1l1	24	erosion	nilm	18	NA	primary	daily labourer	lower-middle class	
399481	pallavi	33	primi	33	cervix and vagina	nilm	20	NA	primary	daily labourer	lower-middle class	ocp
399701	nandini	23	g2p1l1	40	cervix and vagina	nilm	20	NA	uneducated	daily labourer	lower class	

399991	preethi	26	primi	39	cervix and vagina healthy, minimal	nilm with inflammatory smear	23	A	graduate	job	upper class	barrier
404980	sunitha	32	g4p1l1a2	39	cervix and vagina	nilm	20	NA	uneducated	daily labourer	lower class	ocp
405932	anitha	22	g3p2l2	39	cervix and vagina	nilm	19	NA	uneducated	daily labourer	lower class	
406003	chaithra	20	g2p1l1	40	cervix and vagina	nilm	17	NA	uneducated	daily labourer	lower class	ocp
404556	farziya	24	g3p1l1a1	35	cervix and vagina	nilm	20	A	secondary	housewife	upper middle class	IUCD
405973	geetha	24	primi	38	cervix and vagina	nilm	18	NA	uneducated	housewife	lower-middle class	
401012	sudha	26	primi	28	cervix and vagina	nilm with inflammatory	22	A	secondary	housewife	middle class	ocp
406413	ambika	18	primi	38	cervix and vagina	nilm	17	NA	uneducated	daily labourer	lower class	
403388	rukmani	30	g2p1l1	39	cervix and vagina	nilm	27	A	graduate	job	upper class	barrier
406392	madhavi	24	primi	40	cervix and vagina	nilm	22	NA	uneducated	housewife	lower class	
406699	rani	21	g5p2l1d1a2	38	cervix and vagina	nilm	16	NA	uneducated	housewife	lower class	
406722	ayesha siddiqa	22	primi	36	cervix and vagina	nilm with inflammatory	21	NA	uneducated	daily labourer	lower class	
366931	arathi	19	primi	39	cervix and vagina	nilm	18	NA	uneducated	daily labourer	lower-middle class	
360277	malashree	25	g3p1l1a1	38	cervix and vagina	nilm	20	A	graduate	job	upper class	barrier
403436	bharathi	21	primi	38	cervix and vagina	nilm	20	NA	uneducated	daily labourer	lower class	
356231	heena kousar	20	g2p1l1	32	cervix and vagina	nilm with inflammatory	17	NA	primary	housewife	lower-middle class	ocp