ORIGINAL RESEARCH

Comparing the Concordance Between Visual Inspection With Acetic Acid (VIA) and Colposcopy, and Assessing Their Correlation with Papanicolaou Smear in Detecting Cervical Abnormalities

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ABSTRACT

Background:To establish a connection between the identification of an unhealthy cervix through Visual Inspection with Acetic Acid (VIA), colposcopy, and Pap smear results. **Methods**: This research is conducted within a hospital setting, focusing on women aged 20 to 65 exhibiting abnormal symptoms and clinical indications of an unhealthy cervix. The study is conducted in the Department of Obstetrics & Gynaecology, and ethical approval has been secured from the institution to ensure adherence to ethical standards.**Results**:The Pap smear exhibited a sensitivity of 34% and specificity of 94%. In contrast, colposcopy demonstrated high sensitivity (92%) but low specificity (28%). Meanwhile, Visual Inspection with Acetic Acid (VIA) and Visual Inspection with Lugol's Iodine (VILI) yielded comparable sensitivity and specificity, with VIA at 64% and 68%, and VILI at 42% and 40%, respectively. Despite its lower sensitivity, Pap smear showed a notably high positive predictive value of 85%, surpassing colposcopy (56.1%) and visual inspection methods (55%). Notably, colposcopy alone demonstrated the highest diagnostic accuracy at 65%, outperforming other screening methods conducted independently or in combination.**Conclusion**:The recommended approach involves a combination of Pap smear, a screening test, and colposcopic examination reserved for suspected cases. Should any abnormal findings emerge, a colposcopic directed biopsy is advisable. The integration of these methods is essential as it consistently enhances sensitivity, thereby maximizing the overall detection rate.

Keywords:colposcopy,sensitivity,cervix.

INTRODUCTION

Cervical carcinoma, constituting a staggering 80% of all genital tract cancers, stands as the most prevalent malignancy in this category. In the Indian context, cervical cancer takes the forefront as the most common genital malignancy, contributing significantly to the landscape of global cancer incidence where it ranks as the third most common form of cancer.[1] The burden of this disease is substantial, with over 500,000 new cases of invasive cervical cancer being diagnosed annually worldwide.Remarkably, cervical cancer assumes a particularly grim stature as the leading cause of cancer-related mortality among women in developing countries. Its impact on public health is profound, underscoring the urgent need for effective screening, prevention, and treatment strategies.

The historical narrative of cervical disease evolution traces back to 1947 when the concept of preinvasive disease in the cervix was introduced.[2] This preinvasive phase manifests as changes confined to cervical epithelial cells, presenting a crucial window for intervention and targeted management. The journey of cervical cancer unfolds through a protracted preinvasive phase, progressing from cellular atypia to various grades of dysplasia or Cervical Intraepithelial Neoplasia. This intricate progression ultimately culminates in the invasive stage of cancer, emphasizing the importance of early

detection and intervention in preventing the transition to advanced disease.

The potential for effective control of cervical disease progression is rooted in several key factors that collectively create a conducive environment for population screening.[3] The accessibility of the cervix, coupled with the inherent propensity of cervical epithelial cells to exfoliate, their rapid turnover, the diverse spectrum of histopathological changes, and the protracted natural history of the disease, converge to form an ideal landscape for intervention.To comprehensively study the cervix for any indications of premalignant changes, multiple methodologies come into play. These include cytological evaluation through the renowned Pap smear, which involves collecting and examining cervical cells for abnormalities. Visual inspection methods utilizing acetic acid and Lugol's iodine provide additional insights into the cervical health landscape. Colposcopy, a more detailed examination of the cervix using a specialized instrument, and colposcopically directed biopsies contribute further to the diagnostic arsenal.The meticulous integration of these methods not only enhances the sensitivity and accuracy of cervical health assessment but also allows for a detailed exploration of the cellular and structural nuances.[4,5] Through this multifaceted approach, healthcare professionals can discern potential abnormalities and premalignant conditions with greater precision.When cytological abnormalities are identified, the diagnostic journey advances to histopathology, particularly through the examination of colposcopically biopsied lesions. This step ensures a confirmatory and detailed understanding of the nature of abnormalities, thereby refining the diagnosis and guiding subsequent therapeutic interventions.In essence, the collective utilization of these screening methods establishes a comprehensive framework for monitoring and managing cervical health. The synergy between accessibility, cellular dynamics, and advanced diagnostic techniques underscores the significance of a well-structured screening program in controlling and preventing the progression of cervical disease within populations.

Cervical carcinoma presents a complex interplay of risk factors, with the foremost among them being exposure to oncogenic strains of the human papillomavirus (HPV). Beyond HPV, a range of additional factors contributes to the susceptibility to cervical disease, including early age at marriage, the presence of other sexually transmitted diseases (STDs) like human immunodeficiency virus (HIV) and Chlamydia, engaging in multiple sexual partnerships, tobacco smoking, and the use of oral contraceptive pills.[6]The cervix's distinctive accessibility for clinical examination, cytological assessment (such as Pap smear), and tissue sampling procedures has set the stage for comprehensive screening programs. This accessibility is pivotal in initiating proactive measures aimed at early detection and intervention, minimizing the potential progression of abnormalities to advanced stages and, consequently, improving outcomes for affected individuals.Screening programs have become instrumental in leveraging the advantages of widely adopted diagnostic tools, particularly the Pap smear and colposcopy. These methods have played a pivotal role, especially in developed countries, by contributing to a substantial shift in the diagnostic landscape. The emphasis on proactive screening has not only increased the identification of preinvasive stages but has also significantly reduced the incidence of invasive disease, resulting in a notable reduction in mortality rates associated with cervical cancer.[7]The success of these screening initiatives underscores the significance of a multifaceted approach. This approach includes addressing primary risk factors through education and vaccination against HPV, as well as targeting secondary risk factors associated with lifestyle and sexual health. The ongoing global efforts in these areas aim to create a comprehensive strategy that encompasses prevention, early detection, and accessible treatment, collectively advancing the cause of cervical carcinoma control and prevention.

MATERIALS AND METHODS

A comprehensive study was undertaken to establish correlations among the identification of an unhealthy cervix using Visual Inspection with Acetic Acid (VIA), colposcopy, and Pap smear. The study group comprised 200 patients meeting specific inclusion criteria.

Inclusion Criteria

1. **Age Range:** Participants in the study were women aged between 20 to 65 years, representing a broad spectrum of the female population.
2. **Symptoms:** The study focused on women presenting with specific symptoms indicative of potential cervical health issues. These symptoms included abnormal vaginal discharge, post-coital bleeding, and inter-menstrual bleeding.
3. **Clinical Indicators of an Unhealthy Cervix:** The study specifically included women exhibiting clinical signs of an unhealthy cervix. This encompassed various indicators such as erosion, bulky cervix, bleeding upon touch, ulceration, simple leukoplakia, and keratinization.
4. **Pap Smear Abnormalities:** Participants were included if they had Pap smear results indicating dysplasia. This criterion aimed to capture cases where cellular abnormalities were detected through this widely used screening method.

By employing these inclusion criteria, the study sought to create a cohort that represented a diverse range of women with potential cervical health concerns. The inclusion of various symptoms and clinical indicators allowed for a comprehensive exploration of the correlations between different diagnostic methods and the identification of an

unhealthy cervix. The study group's characteristics were carefully defined to ensure a nuanced understanding of the factors contributing to cervical health issues within this specific population.

In order to maintain the study's focus and relevance, a set of exclusion criteria were established to refine the participant selection. These exclusion criteria aimed to exclude certain conditions or situations that might introduce confounding variables or limit the applicability of the study findings.

Exclusion Criteria

1. **Bleeding per Vagina at Examination:** Women experiencing active vaginal bleeding during the examination were excluded. This exclusion ensured that the study could focus on stable conditions and avoid potential complications associated with ongoing bleeding.
2. **Frank Invasive Cancer:** Participants diagnosed with overt invasive cervical cancer were excluded from the study. This exclusion helped maintain a focus on premalignant and early-stage conditions rather than advanced cases.
3. **Underwent Hysterectomy:** Women who had undergone a hysterectomy, a procedure involving the removal of the uterus, were excluded. This ensured that the study focused on individuals with intact cervical anatomy.
4. **Pregnant Women:** Participants who were pregnant at the time of the study were excluded. Pregnancy introduces hormonal and physiological changes that could impact cervical health, potentially confounding the study's objectives.
5. **Oral Contraceptive Pills:** Women currently using oral contraceptive pills were excluded. This exclusion aimed to eliminate the influence of hormonal contraception on cervical health, providing a clearer understanding of the natural state.
6. **Non-Cooperative Patients:** Individuals who exhibited non-cooperative behavior during the examination were excluded. This criterion aimed to ensure reliable data collection and accurate diagnostic assessments.
7. **Unmarried Women:** Unmarried women were excluded from the study, potentially to streamline the sample group and focus on individuals with specific demographic characteristics or health considerations.

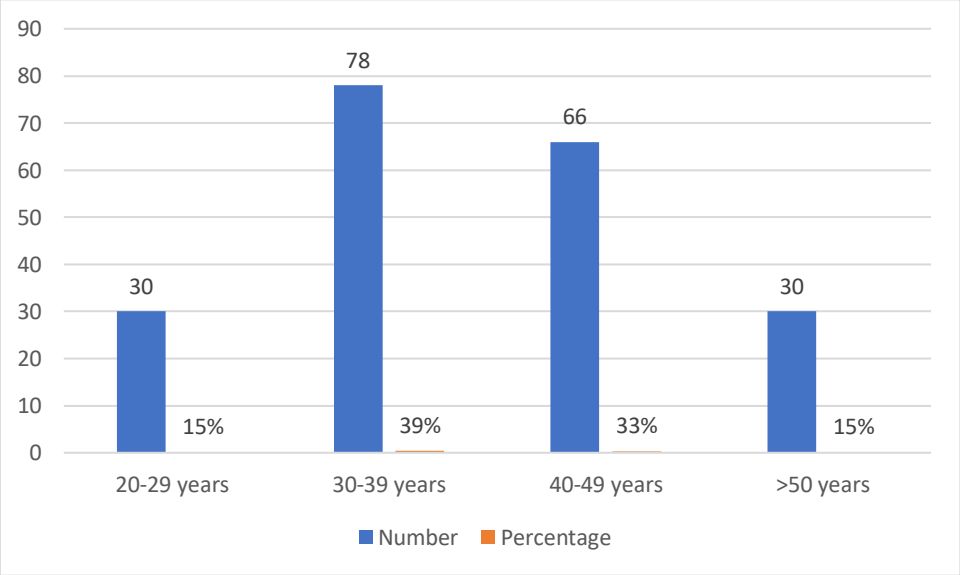
By implementing these exclusion criteria, the study aimed to enhance the internal validity of its findings, providing a more focused and controlled exploration of the correlation between diagnostic methods and the identification of an unhealthy cervix in a specific population subset.

RESULTS

Table 1: Age Distribution

Age Group	Number	Percentage
20-29 years	30	15%
30-39 years	78	39%
40-49 years	66	33%
>50 years	30	15%

Figure 1: Age Distribution

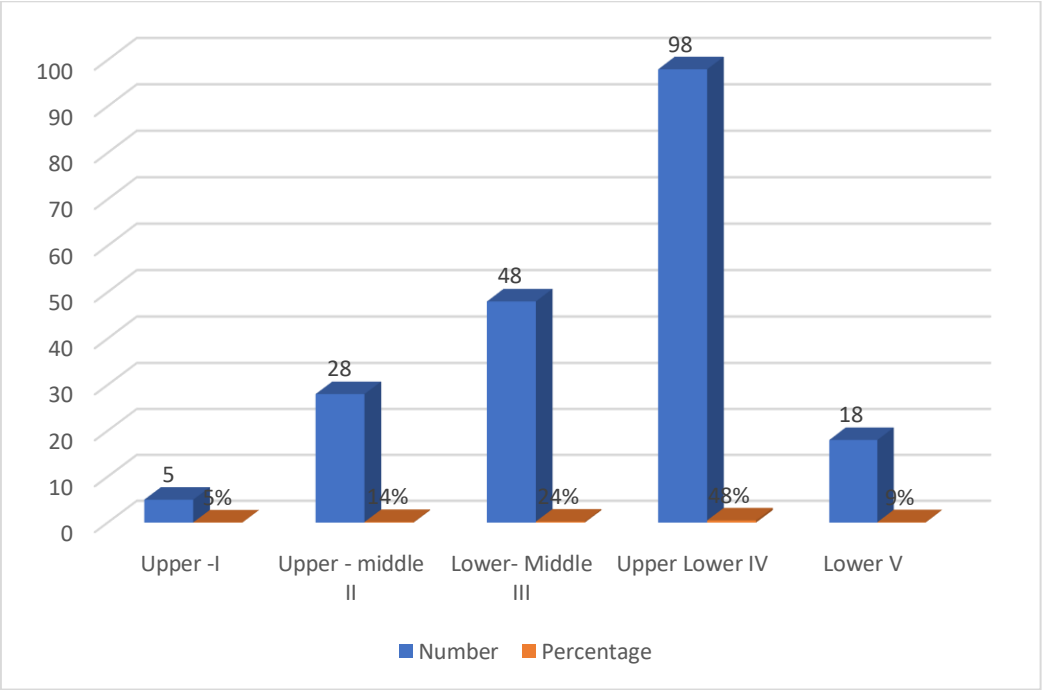


It is noteworthy that a significant majority of participants in this study fall within the age bracket of 30 to 50 years. This age distribution highlights a concentrated focus on a specific demographic range, capturing a critical period in a woman's life when the risk and incidence of cervical health issues may be more pronounced.The choice of this age group aligns with epidemiological trends that often indicate an elevated occurrence of cervical health concerns during the reproductive and perimenopausal years. Women in the age range of 30 to 50 years are often at a stage where hormonal fluctuations, lifestyle factors, and cumulative exposures may influence cervical health. Additionally, this age group is commonly associated with increased sexual activity and reproductive health complexities.By emphasizing this particular age demographic, the study aims to provide targeted insights into the prevalence and diagnostic correlations of an unhealthy cervix during a pivotal phase of a woman's life. The findings from this age group may have implications for screening programs, preventive measures, and early interventions tailored to address the specific needs and risks associated with cervical health in individuals aged 30 to 50 years.

Table 2: Socio-Economic Status

SES	Number	Percentage
Upper -I	5	5%
Upper - middle II	28	14%
Lower- Middle III	48	24%
Upper Lower IV	98	48%
Lower V	18	9%

Figure 2: Socio-Economic Status



The demographic distribution within the study reveals a notable concentration within the upper lower class, constituting a substantial majority at 48%. This socioeconomic categorization provides valuable context for understanding the prevalence and potential disparities in cervical health issues within this specific stratum of the population.The higher representation of participants from the upper lower class underscores the importance of considering socioeconomic factors in the study's findings. Socioeconomic status can influence healthcare access, lifestyle choices, and overall health outcomes. In the context of cervical health, this demographic insight prompts a closer examination of how economic factors may contribute to variations in disease prevalence, detection, and outcomes.

Figure 3: Symptoms

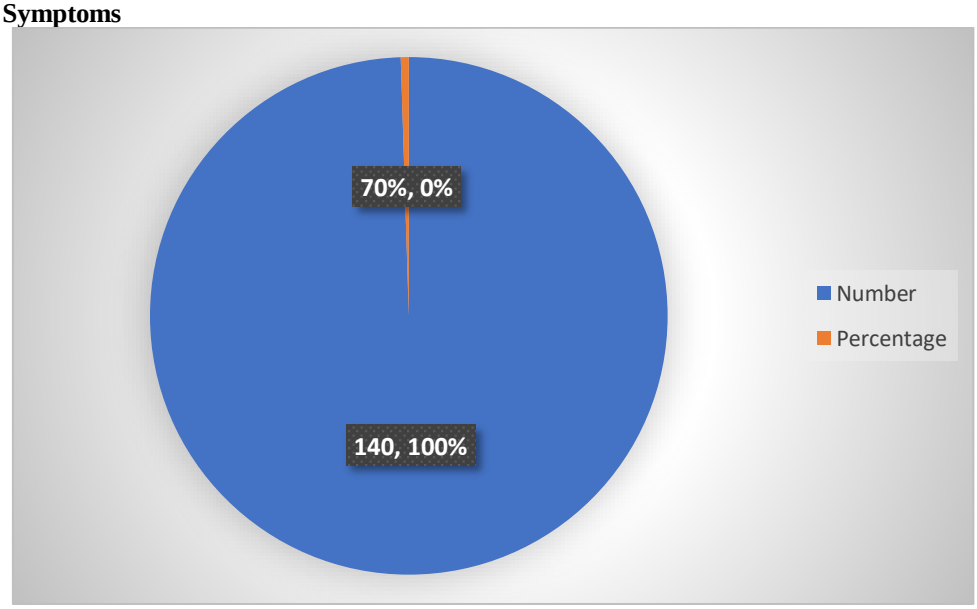


Figure 4: Speculum Findings

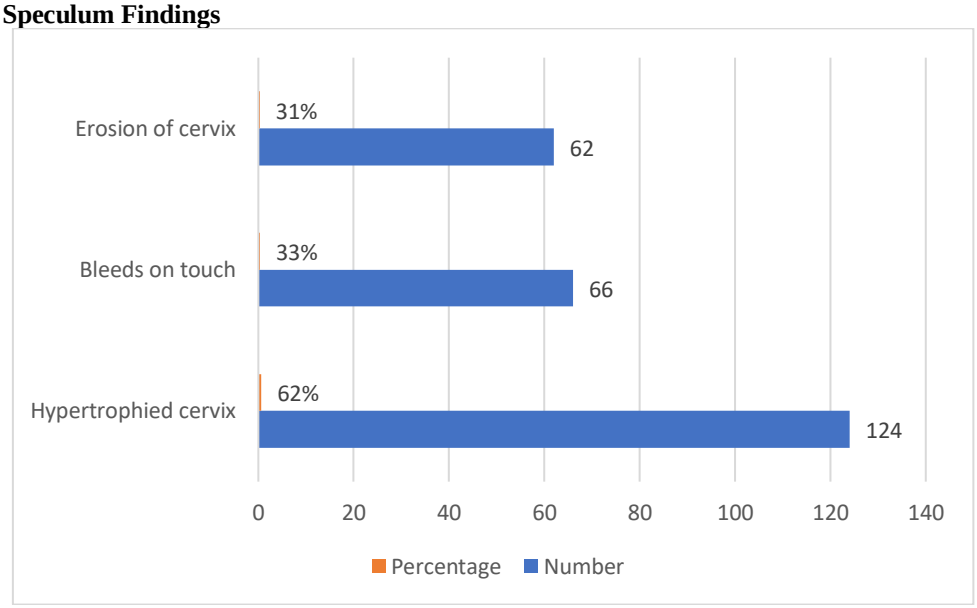


Table 3: Colposcopy Findings

Colposcopy	Number	Percentage
Normal	36	18%
Abnormal	164	82%
A) Acetowhite areas	90	45%
B) Mosaic	26	13%
C) Punctations	42	21%
D) Atypical vessels	6	3%

DISCUSSION

The global epidemiological landscape of cervical cancer paints a stark picture of inequality, with a staggering 80% of new cases emerging in developing countries, juxtaposed against the comparatively lower incidence of 14% in developed nations. Within this global scenario, India bears a substantial burden, grappling with nearly 90,922 new cases and contributing significantly to the global toll, where approximately one-fourth of all cervical cancer-related deaths, totaling 60,000, occur within its borders.Understanding the age dynamics of cervical cancer further illuminates the complexity of this health issue. Globally, the average age at which cervical cancer is diagnosed is reported as 50 years, with an average age at death due to cervical cancer being 60 years. The age distribution reveals a peak in incidence within the 50–54 years age group at the

global level. However, regional studies, such as the one conducted by Rekha et al., highlight the diversity in age demographics, with a mean age of 42.68±11.69 years in their study population. This underscores the importance of considering regional variations in age when developing targeted interventions and screening programs.Economic factors are intricately linked to cervical cancer incidence, as evidenced by studies like the one conducted by Ashmita D, where 46.11% of women diagnosed with cervical cancer belonged to the low socioeconomic class.[8,9] This socioeconomic disparity accentuates the impact of financial limitations on healthcare access, emphasizing the need for interventions that address economic barriers to cervical cancer prevention and treatment.Moreover, specific risk factors, such as excessive vaginal white discharge, identified in studies like that by Vaidya et al., add granularity to our understanding of cervical cancer etiology. The study demonstrated that excessive vaginal white discharge is a risk factor in the development of cervical intraepithelial neoplasia (CIN), underlining the importance of considering biological and behavioral factors in cervical cancer research.[10]Rashmi et al. further contributed to our understanding by highlighting that whitish discharge was the most common presenting complaint, constituting 54% of cases. These findings collectively underscore the multifaceted nature of cervical cancer incidence, involving age, socioeconomic status, and specific risk factors. This comprehensive perspective advocates for targeted public health initiatives, increased awareness, and accessible healthcare services to address the diverse challenges posed by cervical cancer across different regions and populations.

The findings from the study by Durdi GS et al. presented a detailed breakdown of cervical intraepithelial neoplasia (CIN) stages among 300 patients with abnormal colposcopic findings. Within this cohort, 29.8% were diagnosed with CIN I, 1.9% with CIN II, and 7.4% with CIN III. This granular analysis contributes significant insights into the distribution of cervical abnormalities, allowing for a more nuanced understanding of the severity and prevalence of these conditions within the studied population.PapaDasari's study delved further into the incidence of CIN, reporting that 13% of cases were classified as CIN 1, while CIN 2/3 was observed in 11%. These findings underscore the heterogeneity of cervical abnormalities identified through colposcopic examination, highlighting the coexistence of varying degrees of dysplasia within the study population.In the investigation by Pimple SA et al., the evaluation of colposcopy as a secondary test for triaging women who tested positive on visual inspection tests provided comprehensive insights.[11]Colposcopic impressions indicated CIN I changes in 33.8% of cases, CIN II-III in 8.6% of cases, and invasive carcinoma in 2.7% of cases. The subsequent histopathology findings further delineated the nature of these abnormalities, with benign cases accounting for 81.6%, CIN I for 5.8%, CIN II for 2.9%, CIN III for 2.6%, and 2.9% diagnosed with invasive carcinoma. These results not only deepen our understanding of the spectrum of abnormalities but also emphasize the clinical significance of colposcopic impressions in guiding subsequent diagnostic and therapeutic interventions.

Moreover, Pimple SA et al. explored the sensitivity and specificity of colposcopy at different thresholds, revealing variations in diagnostic accuracy. Sensitivity estimates for low- and high-threshold colposcopies were reported as 58% and 74.5%, respectively, while specificity estimates were 57.5% and 92.9%, respectively.[12] This nuanced analysis sheds light on the diagnostic challenges associated with colposcopy and underscores the importance of considering different thresholds in clinical practice.In the studies by Ramesh G. et al. and Malur PR et al., reported sensitivities of 83.33% and 80%, respectively, emphasize the variability in sensitivity values across different research contexts. These variations may be attributed to factors such as the expertise of the colposcopist, the population under study, and the prevalence of cervical abnormalities in different settings.Collectively, these studies provide a comprehensive and multifaceted perspective on the prevalence, distribution, and diagnostic performance of colposcopy in identifying cervical abnormalities, enriching the understanding of cervical health and guiding further research and clinical practices.

CONCLUSION

The primary objective is to implement cost-effective and efficient screening techniques for cervical cancer before the onset of invasive stages, considering its extended preinvasive phase. Visual inspection of the cervix through a simple speculum examination emerges as a crucial step in the early detection of an unhealthy cervix.Colposcopy, while an effective cancer detection method with higher sensitivity, presents challenges such as time consumption, the need for specialized training, and the requirement for expensive equipment. Consequently, it is not practical for large-scale mass screening efforts.To enhance the specificity and mitigate false positives associated with colposcopy, a colposcopic scoring system becomes crucial. This system aids in making informed decisions about the necessity of performing a biopsy in cases where colposcopic findings are pathologically significant, thereby reducing unnecessary invasive procedures.The proposed approach advocates combining the strengths of Pap smear as a screening test with the detailed examination provided by colposcopy, especially in suspected cases. In instances of abnormal findings, the recommendation is to conduct a colposcopically directed biopsy. The synergy between these methods is emphasized, as combined approaches consistently elevate sensitivity levels, maximizing the overall detection rate.In essence, the strategy involves leveraging simpler and

more accessible techniques for widespread screening, reserving the more resource-intensive methods for cases that raise suspicion. This balanced approach ensures both cost-effectiveness and comprehensive diagnostic capabilities in the pursuit of early detection and intervention for cervical cancer.

REFERENCES

1. Ferlay J, Shin HR, Bray F et al. Estimates of worldwide burden of cancer in 2008: GLOBOCAN 2008. International journal of cancer. 2010;127(12):2893-917.
2. World Health Organization. Reproductive Health, World Health Organization, World Health Organization. Chronic Diseases, Health Promotion. Comprehensive cervical cancer control: a guide to essential practice. World Health Organization; 2006.
3. Denny l. Cervical cancer: prevention and treatment. Discov med 2012;14:125-31.
4. WHO. Comprehensive cervical cancer control. Google scholar a guide to essential practice, 2006.
5. Mohanty J, Mohanty BK. Risk factors in invasive carcinoma of cervix. J ObstetGynaecol India, 1991,403-6.
6. Ashmita D, Shakuntala PN, Rao SR et al. Comparison and correlation of PAP smear, colposcopy and histopathology in symptomatic women and suspicious looking cervix in a tertiary hospital care centre. Int J Health Sci Res. 2013;3(5):50-9.
7. Vaidya A. Comparison of Pap test among high and non- high risk female. Kathmandu University medical journal (KUMJ). 2003;1(1):8-13.
8. Dasari P. Grossly abnormal cervix: evidence for using colposcopy in the absence of squamous intraepithelial lesion by conventional papanicolau test. Journal of Gynecologic Surgery. 2011;27(1):5-8
9. Pimple SA, Amin G, Goswami S et al. Evaluation of colposcopy vs cytology as secondary test to triage women found positive on visual inspection test. Indian journal of cancer. 2010;47(3):308.
10. Sankaranarayanan R, Budukh AM, Rajkumar R. Effective screening programmes for cervical cancer in low-and middle-income developing countries. Bulletin of the World Health Organization. 2001;79:954-62.
11. Mallur PR, Desai BR, Anita D et al. Sequential screening with cytology and colposcopy in detection of cervical neoplasia. J South Asian Feder Obst Gynae. 2009;1:45-8.
12. Moss EL, Dhar KK, Byrom J et al. The diagnostic accuracy of colposcopy in previously treated cervical intraepithelial neoplasia. Journal of lower genital tract disease. 2009;13(1):5-9.