Correlation of colposcopy using Reid colposcopic index with histopathology- a prospective study

Reid Kolposkopi endeksi kullanılarak yapılan kolposkopinin histopatoloji ile korrelasyonu- prospektif bir çalışma

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Abstract

Objective: To estimate the diagnostic efficacy of colposcopy & determine the strength of correlation between colposcopic impression using the Reid Colposcopic Index (RCI) and histopathology.

Material and Methods: This was a prospective cross sectional study carried out in the colposcopy clinic at KLES Dr. Prabhakar Kore Hospital & Medical Research Centre, Belgaum from January 2008 to June 2009. A total of 268 women who fulfilled the selection criteria were included in the study. All women underwent colposcopy and a diagnosis was made based on RCI. Colposcopy directed biopsy was obtained from the abnormal areas. In cases where colposcopy did not reveal any lesion, a four quadrant biopsy from the squamocolumnar junction was taken, which served as a gold standard.

Results: Three women who had an unsatisfactory colposcopy & eleven women with the diagnosis of cervical cancer were excluded from the analysis. The sensitivity, specificity, positive predictive value & negative predictive value of colposcopy with CIN 1 as a disease threshold was 88.5%, 86.2%, 77% & 93.5% respectively. With CIN 2 as a disease threshold the sensitivity, specificity, positive predictive value & negative predictive value of colposcopy were 85.2%, 99.6%, 95.8% & 98.3% respectively. The degree of correlation between colposcopic impression using RCI & histopathology was high (k=0.73).

Conclusion: Colposcopy is an indispensable tool in the diagnosis of precancerous lesions & the good correlation between colposcopic impression using RCI & histopathology makes it a reproducible technique which is easy to implement in colposcopy clinics.

(J Turkish-German Gynecol Assoc 2009; 10: 205-7)

Key words: Colposcopy, Reid colposcopic index, cervical cancer, cervical intraepithelial neoplasia

Received: 18 September, 2009 **Accepted:** 14 November, 2009

Özet

Amaç: Kolposkopinin tanısal etkinliğini değerlendirmek ve Reid Kolposkopi Endeksi (RKE) kullanılarak elde edilen kolposkopik gözlemin histopatoloji ile korrelasyon gücünü araştırmak.

Gereç ve Yöntemler: Bu çalışma prospektif kesitsel bir araştırma olarak Ocak 2008 ve Haziran 2009 tarihleri arasında Dr. Prabhakar Kore Hastanesi Kolposkopi kliniğinde yapılmıştır. Seçim kriterlerine uygun 268 kadın çalışmaya dahil edildi. Tüm kadınlara kolposkopi yapıldı ve RKE kullanılarak tanı konuldu. Anormal görünen alanlardan kolposkopi altında biyopsi yapıldı. Kolposkopik olarak patoloji izlenmeyen kişilerde skuamokolumnar bileşkeden dört kadran biyopsi yapıldı ve altın standart olarak değerlendirildi.

Bulgular: Yetersiz kolposkopik gözlemi olan üç kadın ve serviks kanseri tanısı alan 11 olgu çalışmadan dışlandı. Kolposkopinin CIN 1 tanısındaki duyarlılığı, özgüllüğü, pozitif ve negatif öngörme değeri sırasıyla %88.5, %86.2, %77 ve %93.5 idi. CIN 2 tanısındaki duyarlılığı, özgüllüğü, pozitif ve negatif öngörme değeri sırasıyla %85.2, %99.6, %95.8 ve %98.3 idi. RKE kullanılarak elde edilen gözlemin histopatoloji ile korrelasyonu yüksekti (k=0.73).

Sonuç: Kolposkopi prekanseröz lezyonların tanısında vazgeçilmez bir araçtır. RKE kullanılarak elde edilen görüntülemenin histopatoloji ile yüksek korrelasyonu bu aracın kolayca kolposkopi kliniklerine entegre edilebilmesini ve başka jinekologlar tarafından da kullanılabilmesini sağlamaktadır.

(J Turkish-German Gynecol Assoc 2009; 10: 205-7)

Anahtar kelimeler: Kolposkopi, Reid kolposkopi endeksi, servix kanseri, servikal intraepitelyal neoplazi

Geliş Tarihi: 18 Eylül 2009 **Kabul Tarihi:** 14 Kasım 2009

Introduction

Cervical cancer is a global health problem and is the leading cause of death due to cancer among women in developing countries. According to the WHO projections in 2005, there were over 500,000 new cases of cervical cancer, of which over 90% were in developing countries. Almost 260,000 women died of the disease, nearly 95% of them in developing countries. Cervical cancer has a long latent phase and can be prevented easily by early detection using various screening procedures like Pap smear, HPV DNA testing, visual inspection with acetic acid and visual inspection with lugol's iodine (1). However, colposcopy remains the reference standard for assessing the validity of all the screening procedures (2).

Colposcopy is a visual technique that requires extensive training and experience. The limiting factor in the use of this diagnostic tool is that the accuracy of the method is directly related to the expertise of its operator. Hence, to ensure that

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colposcopy gives a satisfactory level of accuracy in addition to proper training and certification of colposcopists, an objective grading system needs to be incorporated (3). Reid and Scalzi proposed the Reid Colposcopic Index (RCI) to make colposcopic diagnosis less subjective (4). RCI relies on critical analysis rather than on pattern recall. This study was undertaken to evaluate the diagnostic efficacy of colposcopy using RCI and to determine the degree of correlation between colposcopic impression and histopathology.

Material and Methods

The present study is a prospective cross sectional study carried out in the colposcopy clinic at the KLES Dr. Prabhakar Kore Hospital and Medical Research Centre from January 2008 to June 2009.

A total of 268 women referred to the colposcopy clinic with complaints of persistent vaginal discharge, suspicious looking cervix, postcoital bleeding, post menopausal bleeding, inter menstrual bleeding or with positive cervical cancer screening test results were included in the study. Exclusion criteria were frank growth on the cervix & prior total hysterectomy.

Colposcopy was performed by any one of the three gynecologists trained in colposcopy using a video colposcope. Colposcopy directed biopsy was obtained from the abnormal areas using a punch biopsy forceps and, in cases where colposcopy was interpreted as normal, a four quadrant cervical biopsy was obtained from the squamocolumnar junction (SCJ) so as to assess the efficacy of RCI. Colposcopic diagnosis was made based on RCI. The total score for detecting the lesion are as follows: 0-2, low grade lesion (likely to be CIN 1): 3-4, intermediate grade (likely to be CIN 1 or CIN 2): 5-8, high grade lesion (likely to be CIN 2 or CIN 3) (4, 5). Biopsy results were categorized as benign, CIN 1, CIN 2, CIN 3 and invasive cervical cancer.

Cases of unsatisfactory colposcopy and early invasive cervical cancer were excluded from the analysis as RCI cannot be used in their diagnosis. The sensitivity, specificity and predictive values were calculated with the disease threshold of CIN 1 as well as CIN 2. The degree of correlation between colposcopic impression using RCI and histopathology was assessed using unweighted 'k' statistics.

Results

Of the 268 women enrolled in the study, 14 were excluded from the analysis as three had unsatisfactory colposcopy and 11 had colposcopic features suggestive of invasive cervical cancer. The majority of the women who participated in the study were in the age group of 30-40 years (43.7%) with the mean age of 36 years. 46% of the women had a parity of two and 34.5% had a parity of three. The chief complaint was white discharge in 66% of the women, followed by post menopausal bleeding in 6.7%, post coital bleeding in 5.1%, inter menstrual bleeding in 0.8%, and 21.3% were referred for suspicious looking cervix. Pap smear results were known in 71.8% of the study population, of whom 29.2% had atypical squamous cells of undetermined significance (ASCUS), 23.8% had low grade squamous intraepithelial lesions (LSIL) and 12% had high grade squamous intraepithelial lesions (HSIL).

Of the 254 biopsies taken ,101 (39.76%) were from the abnormal areas and, in 153 (60.28%) cases where colposcopy was interpreted as normal, a four quadrant biopsy was obtained from the SCJ.

The agreement between colposcopic impression using RCI & histopathology and their correlation are shown in table no.1 and 2. Of the 60 (23.62%) cases of biopsy proven CIN 1, nine were negative on colposcopy and 51 (20.07%) cases were accurately diagnosed. Of 27 (10.63%) biopsy proven cases of CIN 2 and above, one (0.4%) case was reported as benign & three (11.1%) as CIN 1. Although colposcopic diagnosis of CIN 1 was made in 76 cases, over estimation was noted in 22 cases and three cases of biopsy proven CIN 2 were underestimated. CIN 2 lesions were noted in five cases, of which one (4.1%) case was underestimated. An accurate diagnosis was made in all the 19 biopsy proven cases of CIN 3.

Out of the 167 biopsy negative cases using CIN 1 as the disease threshold, colposcopy could accurately confirm the absence of disease in 144 cases. In the remaining 23 biopsy negative cases, colposcopic diagnosis of CIN 1 was made in 22 cases and CIN 2 in one case. The association between colposcopic impression using RCI and histopathology was highly significant ($p<.001$). The 'k' value for the strength of correlation between colposcopic impression for CIN 1 using RCI and histopathology was $k=0.66$ ($p<0.001$), for CIN 2 it was $k=0.60$ ($p<0.001$) and for CIN 3 it was $k=1$. Overall the colpo histological correlation was $k=0.73$, $p<0.001$.

The sensitivity & specificity of colposcopy with CIN 1 as disease threshold was 88.5% (CI 84.6-92.4) and 86.2% (CI 82-90.4)

Table 1. Agreement between colposcopic impression using RCI and histopathology

Histopathology Results	Colposcopy Results				Total
	Benign	CIN 1	CIN 2	CIN3	
Benign (%)	144 (57)	22 (8.6)	1 (0.4)	-	167
CIN 1 (%)	9 (3.5)	51 (20.1)	-	-	60
CIN 2 (%)	1 (0.4)	3 (1.1)	4 (1.5)	-	8
CIN 3	-	-	-	19 (7.4)	19
Total	154	76	5	19	254

Table 2. Correlation of colposcopy using RCI and histopathology

Colposcopy results	Over estimation (%)	Under estimation (%)	Accurate estimation (%)	Total
Benign	-	10 (6.5)	144 (93.5)	154
CIN 1	22 (29)	03 (3.9)	51 (67.1)	76
CIN 2	-	01 (20)	04 (80)	05
CIN 3	-	-	19 (100)	19
Total	22 (8.7)	14 (5.5)	218 (85.8)	254
Colpohistological correlation- 85.8 %				

respectively. The sensitivity and specificity of colposcopy with CIN 2 as disease threshold were 85.2% (CI 80-89.6) and 99.6% (CI 98.9-100) respectively. The positive predictive value, negative predictive value, false positive and false negative rate with CIN 1 as the disease threshold were 77%, 93.5%, 13.8% and 11.5% respectively. With CIN 2 as the disease threshold the positive predictive value, negative predictive value, false positive and false negative rate were 95.8%, 98.3%, 0.4% and 14.8% respectively.

Discussion

The present cross sectional study aimed at evaluating the efficacy of colposcopy using RCI and determining the strength of correlation between colposcopic impression and histopathology. In our study colposcopy was performed by clinicians who were certified and experienced in this technique. Overall, there was good agreement between colposcopic impression using RCI & histopathology. However, the degree of correlation with histopathology was excellent for CIN 3 lesions as compared to CIN 1 & CIN 2 lesions. Colposcopy revealed a satisfactory sensitivity of 88.5% using CIN1 as threshold, which was slightly greater as compared to the sensitivity of colposcopy using CIN2 as threshold (85.2%). This difference was noted in the present study because three of the biopsy proven CIN2 lesions were underestimated as CIN1. Underestimation may occur when a high grade lesion may be overlooked, which may appear as an inner border of sharp acetowhite demarcation within a less opaque acetowhite area (6). When the threshold was raised to CIN 2, the specificity was more (99.6%) as compared to that of CIN1 as the disease threshold (86.2%). Confusion amongst CIN1, cervicitis and HPV infection may account for inaccuracy of diagnosis of low grade lesions by colposcopy (3). The predictive value of colposcopy was also shown to be better with increasing grades of neoplasia. This implies that colposcopy performs better in the diagnosis of high grade lesions.

The present study showed a higher sensitivity and similar specificity compared to ASCUS-LSIL triage study (7) and a study carried out by Mousavi A.S. et al. (8) where RCI was used to interpret the colopscopy findings. There was a good strength of correlation between colposcopic impression using RCI and histopathology in our study, which was comparable to a study carried out by Mousavi A.S. et al. (8). Although accuracy of colposcopy is attributed to the operator expertise, colposcopists may not be entirely responsible for the disagreement between the colposcopic impression and histologic diagnosis, as a certain degree of inter observer variability occurs among the pathologists while histologically grading CIN (9).

In the present study however, comparison was not made with colposcopic impression without the use of RCI. Another limitation of our study is that high grade lesions should have been biopsied using a loop to avoid sampling error.

Colposcopy directed biopsy provides a histopathological diagnosis and colposcopic impression provides information concerning the lesion size and location, which forms the basis for additional management (3). Women with pre invasive lesions can be effectively managed using the 'see and treat' approach to achieve maximum compliance of the screening of positive women especially in low resource countries. However the decisions are often anchored on colposcopic assessment (10, 11).The use of this scoring and grading system may guide colposcopic interpretation so that higher grade lesions are not missed and trivial findings are not over interpreted.

In conclusion colposcopy using RCI has satisfactory diagnostic efficacy and the good correlation between colposcopic impression and histopathology makes it a valid tool in the diagnosis and management of precancerous lesions.

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