

Accuracy of Abnormal Pap Smear at Thammasat University Hospital

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The aim of the present study was to assess the sensitivity, specificity and accuracy of the Pap smear in the diagnosis of squamous intraepithelial lesion (SIL) and squamous cell carcinoma (SCC). Pap smear of 15,345 women in 2 years were screened for early detection of abnormal cervix. In 299 cases (1.9%) were diagnosed as low-grade SIL (LSIL), high-grade SIL (HSIL) and SCC by the Bethesda system (TBS) 2001. Only 195 cases (1.3%) had definitive histologic diagnosis as negative, human papilloma virus (HPV) infection, cervical intraepithelial neoplasia (CIN) 1, CIN 2, CIN 3 and SCC. The sensitivity, specificity and accuracy in LSIL was 86.5%, 70% and 71.3%, respectively. For HSIL it was 80.8%, 89.7% and 86.2%, respectively. For SCC it was 100%, 96.9% and 96.9%, respectively. Our data had high diagnostic performance for HSIL and SCC group and moderate diagnostic performance for LSIL group.

Keywords: Abnormal Pap smear; CIN, Bethesda system

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Pap smear is widely used for early cervical cancer diagnosis. Cervical cancer have precursor stages and histologic diagnosis as cervical intraepithelial neoplasia (CIN). CIN is divided in grade 1, 2 and 3⁽¹⁾. Malignant neoplasia of the cervix is the model which is the greatest power of early detection and of methods for the screening and prevention of cancer by Pap smear⁽²⁾. The term "squamous intraepithelial lesion (SIL)" was first introduced with the Bethesda system (TBS) 1988 and was maintained in TBS 1991 and 2001. TBS classified SIL into two categories: low-grade SIL (LSIL) and high-grade SIL (HSIL). LSIL has been defined as a cytologic diagnosis for women with Pap smear showing cytologic criteria of HPV infection or CIN 1. HSIL is used for cytologic diagnosis of CIN 2 and CIN 3 (severe dysplasia and carcinoma in situ)⁽³⁻⁵⁾.

The success of cervical cancer prevention and early detection depends on accurate cytologic diagnosis including sensitivity and specificity of Pap smear. The gold standard for diagnostic performance

of Pap smear is histopathologic evaluation.

The objective of the present study is to evaluate cytology accuracy, sensitivity and specificity of Pap smear at Thammasat University Hospital.

Material and Method

During a period of 2 years (December 2007-November 2009), a total of 15,345 ThinPrep[®] and conventional Pap smear at Thammasat University Hospital were screened for early detection of cervical cancer. Abnormal Pap smear diagnoses based on the TBS 2001 were reported as LSIL, HSIL and squamous cell carcinoma (SCC). Abnormal glandular lesions and atypical squamous lesions were excluded from the present study. A total of 299 Pap smears (1.9%) were diagnosed as LSIL, HSIL and SCC by TBS 2001. Only 195 cases (1.3%) had definitive histologic diagnosis as negative, human papilloma virus effect (HPV), CIN 1, CIN 2, CIN 3 and SCC. Final diagnosis from histology was used as the gold standard for calculations of sensitivity, specificity and accuracy of Pap smear.

Results

Table 1 showed the cytologic diagnosis by TBS 2001 classification and grouped the premalignant lesions into LSIL and HSIL as correspondences

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Table 1. Cytology versus histology

	Histology						Total
	Negative	HPV	CIN1 CIN1 + HPV	CIN2 CIN2 + HPV	CIN3 CIN3 + HPV	SCC	
Cytology							
LSIL	36	35	29	10	-	-	110
HSIL	3	4	5	23	40	-	75
SCC	-	-	1	-	5	4	10
Total	39	39	35	33	45	4	195

LSIL: low-grade squamous intraepithelial lesion, HSIL: high-grade squamous intraepithelial lesion, SCC: squamous cell carcinoma, HPV: human papilloma virus, CIN: cervical intraepithelial neoplasia

diagnosis in histology. The total 195 women diagnosed LSIL 110 cases; definite histology as negative, HPV, CIN1/CIN1 with HPV and CIN2/CIN2 with HPV were 36, 35, 29 and 10 cases, respectively. A total 75 cases of HSIL; 3, 4, 5, 23 and 40 showed negative, HPV, CIN 1/CIN 1 with HPV, CIN2/CIN2 with HPV and CIN3/CIN3 with HPV, respectively. A total 10 cases of SCC; 1, 5, 4 showed CIN1/CIN1 with HPV, CIN3/CIN3 with HPV and SCC, respectively.

The results of sensitivity, specificity and accuracy were shown in Table 2. The sensitivity varied from 80.8% to 100%, specificity from 70% to 96.9% and accuracy from 71.3% to 96.9%.

Discussion

The results for the sensitivity, specificity and accuracy of Pap smear in the literature, regardless of the type of specimen preparation (conventional or liquid-based cytology) are about 30-100%, 48-100% and 43.4-90%, respectively⁽⁶⁻¹⁵⁾. Liquid-based cytology (LBC) is generally assumed to produce better-quality sample than conventional smear; that might relate to higher sensitivity, specificity and accuracy^(8,16,17). This result was not confirmed in Longotto-Filho report⁽¹⁰⁾. The specificity of the conventional Pap smear is superior, the inferior specificity of LBC method can occur from errors in interpretation, abnormal cells which have morphologic variation in LBC specimen. Jسداتاراکول⁽⁹⁾ found similar rate of accuracy of LBC and conventional smear.

In the present study, we demonstrate a sensitivity for LSIL, HSIL and SCC were 86.5%, 80.8% and 100%, respectively. Specificity for LSIL, HSIL and SCC was 70%, 89.7% and 96.9%, respectively. Accuracy for LSIL, HSIL and SCC were 71.3%, 86.2% and 96.9%, respectively. The sensitivity, specificity and

Table 2. Sensitivity, specificity and accuracy

	Pap smear diagnosis		
	LSIL	HSIL	SCC
Sensitivity (%)	86.5	80.8	100
Specificity (%)	70	89.7	96.9
Accuracy (%)	71.3	86.2	96.9

accuracy for HSIL and SCC were higher than previous reports^(6,8,10,14). The sensitivity for LSIL (86.5%), specificity (70%) and accuracy (71.3%) found similar rate as Longotto-Filho report⁽¹⁰⁾. Our sensitivity (86.5%) was higher than Saha study (60%)⁽¹⁴⁾ and Van Hemel study (39.7%)⁽¹⁵⁾, but specificity (70%) was lower than Saha study (93.9%) and Van Hemel (89.2%) study. The variation in cytohistologic correlation reported by the present study and various studies may be due to many factors^(8,18-21); such as the women population, collection methods (LBC or conventional), the diagnostic criteria utilized, the experience and the skill of the cytotechnologists and cytopathologists.

Conclusion

Our data had high diagnostic sensitivity, specificity and accuracy for HSIL and SCC groups, was moderate diagnostic performance for LSIL group. All staffs in cytology laboratory often refresh new diagnostic knowledge, more training and more conference in difficult cases which improve the diagnostic performance of Pap smear.

Potential conflicts of interest

None.

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ความถูกต้องของการวินิจฉัยแป็ป smear ที่ผิดปกติในโรงพยาบาลธรรมศาสตร์เฉลิมพระเกียรติ

นิภา กาญจนวิโรจน์กุล, รจนา ม่วงเล็ก, ลัคกุล ยานากิฮาระ

วัตถุประสงค์ของการศึกษานี้เพื่อประเมินค่าความไว ความเฉพาะและความถูกต้องของการวินิจฉัยเซลล์ ปากมดลูกที่ผิดปกติระดับเซลล์กึ่งมะเร็งและเซลล์มะเร็งชนิดสแควมัส กลุ่มตัวอย่างสตรีทั้งหมด 15,345 คน ที่มาตรวจแป็ป smear เพื่อหาความผิดปกติของเซลล์ปากมดลูกในระยะเริ่มแรก การรายงานผลทางเซลล์วิทยา ด้วยระบบเบเทสดา 2001 สตรีจำนวน 299 ราย (1.9%) ผลการวินิจฉัยทางเซลล์วิทยาเป็น LSIL, HSIL และมะเร็งชนิด สแควมัสชั้นลุกลาม เพียง 195 ราย (1.3%) ที่ได้รับการตรวจทางพยาธิวิทยา ผลการวินิจฉัยทางขึ้นเนื้อเป็นเซลล์ปกติ กลุ่มที่ติดเชื้อไวรัส HPV กลุ่มที่เป็นเซลล์กึ่งมะเร็งคือ CIN1, CIN2, CIN3 และกลุ่มมะเร็งชนิดสแควมัสชั้นลุกลาม ค่าความไว ความเฉพาะและความแม่นยำของกลุ่ม LSIL เป็นร้อยละ 86.5 ร้อยละ 70 และ ร้อยละ 71.3 ตามลำดับ กลุ่ม HSIL เป็นร้อยละ 80.8 ร้อยละ 89.7 และ ร้อยละ 86.2 ตามลำดับ กลุ่มมะเร็งชนิดสแควมัสชั้นลุกลามเป็นร้อยละ 100 ร้อยละ 96.9 และร้อยละ 96.9 ตามลำดับ ข้อมูลการศึกษานี้ พบค่าความสำเร็จของการวินิจฉัยสูงสำหรับกลุ่ม HSIL และมะเร็งชนิดสแควมัสชั้นลุกลาม ส่วนกลุ่ม LSIL มีค่าความสำเร็จของการวินิจฉัยปานกลาง
