RESEARCH COMMUNICATION

Situation Analysis for Management of Abnormal Pap Smears in the Lower Southern Thailand

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Abstract

   <u>Objective:</u> To identify the resources for management of abnormal Pap smears and the treatment facilities in pre-invasive cervical neoplasia in the lower southern Thailand. <u>Methods:</u> After reviewing the necessary data, an expert meeting was scheduled for questionnaire development. The questionnaires were then sent to the general, regional, and university hospitals in the lower southern Thailand for self-evaluation and on-site visits were made for intensive interviews, exploring the services and treatment facilities for women with abnormal Pap smears. <u>Results:</u> All of the 12 target hospitals provided passive cervical cancer screening although the quality of cytological services was obscure and the process of patient notification for the results of the abnormal Pap smears was not convincing. There was a limitation in the pathological laboratory services. The incidence of the abnormal Pap smears in the one-year period of the study, defined as atypical squamous cells of undetermined significance (ASCUS) or above and high grade squamous intraepithelial lesions (HSIL) or above were 1.24%(95%CI 1.15-1.32) and 0.36%(95% CI 0.30-0.43) respectively. All but one hospital reported having a colposcope, but only one could provide standard colposcopy services. The efficiency of the referral system is questionable. <u>Conclusion:</u> The resources for the management of abnormal Pap smears as well as the conventional referral system need to be reorganized. The data from this survey support the concept of a centralized colposcopy service with the University hospital as suitable place for the referral center. Two further 2 hospitals have potential for future development as referral centers.

Key Words: Abnormal Pap smears - lower Southern Thailand - situation analysis

Introduction

   Cervical cancer is a disease burden worldwide, especially in the developing countries. It is the most common cancer among Thai women. From the data of cancer in Thailand (Sriplung et al., 2003), the age-standardized incidence rate (ASR) is 19.5. The highest incidence is in the northern part of the countries (ASR=25.6) and the lowest incidence is in the Northeastern (ASR=15.0). The ASR in the south is 16.1 during the period of 1995-1997, compared to 13.2 during the period of 1988-1989 (Chichareon, 1993). However the latter was the ASR of the cervical cancer before the period of well established national policy and tumor registration system. In Thailand, this cancer can be diagnosed as early as 20 years old and reaches the peak at the age of 45-50, and plateau since then (Deerasamee et al., 1999).

   Although the cervical cancer is the suitable cancer to be screened, the effective screening programs are still absent in most of the world. The minimum program goals to be achieved should include screening women aged 35-50 at least once, treating women those have high-grade dysplasia appropriately, and having an effective monitoring as well as program evaluation (Heardman et al., 2000). When focus on convincing Pap smears screening, the minimum requirement includes well-trained providers, sufficient equipment and supplies, reliable cytological laboratory, accuracy of the Pap smears report, timely communication of the result, and effective referral system.

   National policy of cervical cancer screening in Thailand is well established, but the implementation is not successful. To reach the mission of the Gynecologic Oncology Unit of the Faculty of Medicine, Prince of Songkla University in decreasing the ASR of cervical cancer in the south of Thailand to be less than 10/100 000 women, the situation of the cervical cancer screening emphasizing on the management of the abnormal Pap smears is analyzed. It

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hopes to be the first step to overcome many obstacles involved in cervical cancer control in this area.

Material and Methods

The study was carried out during the year 2002-2003. Before starting the project, the public health care system, the documented referral system, and the geographic context were reviewed. The outline of the study was shown in Fig 1. The first step was experts meeting to set the terms of reference, and to conclude their expectations about the screening program in this region. After that, the questionnaire was developed. It is composed of the 6 key parts, which included the characteristics of the hospitals, Pap smears screening services, laboratory section, colposcopy services, referral system, and obstacles in management of abnormal Pap smears. The questionnaire was tested for validity before used and was sent to all of authorized chief of Obstetrics and Gynecology unit of the general, regional and university hospitals in the lower southern Thailand for self-evaluation. Two weeks later, the investigators visited all of theses hospital for on-site intensive interview, to explore the real services and treatment facilities. The on-site intensive interview focused on the following aspects:

- checking the accuracy of the data from the previous questionnaire
- the real situation of the service such as the Pap smears technique, the transportation process, the laboratory service, the process of data collection, the referral process, etc
- the treatment facilities
- the attitude of Pap smears test's provider, emphasized on the obstacles of cervical cancer screening
- the physician's attitude about abnormal Pap smears registration and net work in management of abnormal Pap smears (N-MAP)
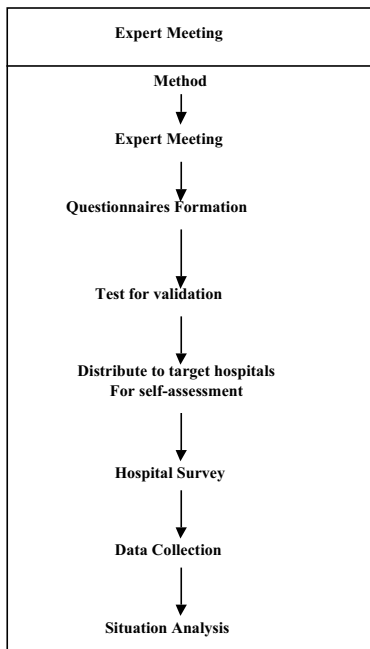
Results

Geographic context (Figure 2.)

The southern part of Thailand is a long peninsular strip between the Indian Ocean to the West and the China Sea to the East. It covers 13.8% and 13.1% of the whole country area and the whole population respectively. The gross regional product is 8%. There are 14 provinces in the South, which can be divided into upper and lower region. The lower southern region, which locates between latitudes 5° N and 7° N, and between longitude 99° E and 102° E composed of 7 provinces; Trang, Phatthalung, Satun, Songkhla, Yala, Pattani, and Narathiwat. Most of the people in the last three provinces are Muslims. Rice farming, fishing and shrimp farming, and rubber plantation are the main occupations.

Public Health Care System

In the past, the health system of Thailand had spent an unlimited budget for treatment, and had paid less attention to preventive measures. Under the "Health for All' policy, the principles is changed. The government provides the budget of 1,200 Baht ($30.00) per capitation per year to cover 46.6 million Thai people. These people have no any type of health insurance. For this budget, 175 Baht ($4.38) is used for health promotion and prevention of the disease. A Pap smears screening provided by public health service, whose cost is varies between 50-80 Baht (1.25-2 US$) is included in this part of budget. However to create the sense of participation, and to prevent the over utilization, the co-payment is set at 30 Baht ($0.75) at each hospital visit, which made this system was known as "30 Baht Project".
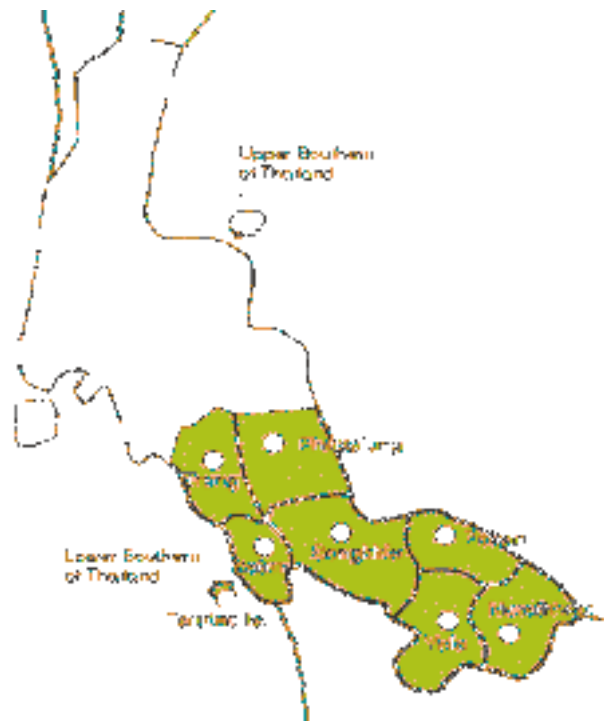

Expert Meeting

Method

Expert Meeting

Questionnaires Formation

Test for validation

Distribute to target hospitals
For self-assessment

Hospital Survey

Data Collection

Situation Analysis

Figure. 1 Outline of the Study Process

Figure 2. Map of Lower Southern Thailand and the Surveyed Hospital

The contracting health services under "Health for All" policy can be classified into 3 levels. They are contracting unit for primary health care (CUP), contracting unit for secondary care (CUS), and contracting unit for tertiary care (CUT). CUP has a responsibility to contribute the primary care unit (PCU). Each PCU covers 10 000 people and provides front-line care, on-going/longitudinal care, comprehensive and coordinate care. CUS provides health services that require hospitalization. Only PCU and CUP can refer the patient to CUS. CUT provides specialized, and sophisticated health cares, that require high technology or high cost of treatment. They also include a referral center; such as cancer, cardiac, organ transplant center, etc. The algorithm of the referral system is shown in Fig 3.
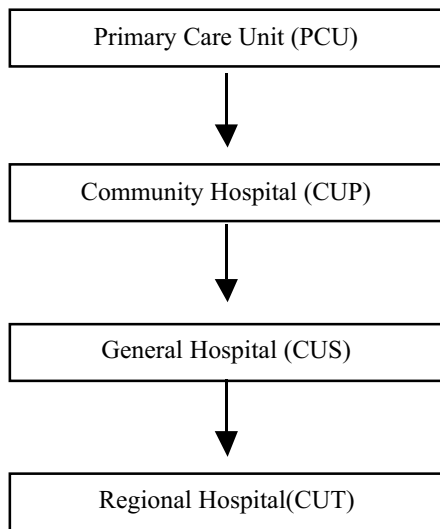
The Ministry of Public Health has divided the lower southern part of Thailand to be 2 areas depend on the Health Care Delivery System. The first area includes 4 provinces; Songkhla, Trang, Satun, and Phatthalung. The second area includes 3 provinces; Yala, Pattani, and Narathiwat. The lower southern Thailand covers 454 933 square kilometers with a total female population of 2 137 109. The female age between 35-54 years old is about 20% of the whole female population.

Characteristics of the hospitals

The 12 target hospitals; which included 8 general hospitals, 2 regional hospitals, 1 Maternal and Child hospital, and 1 university hospital, was divided into 4 groups depend on the total beds, number of the gynecologist, and the Obstetrical and gynecological services. The details were shown in Table 1.

Pap smears screening

The Pap smears that is performed on request or as the opportunistic screening is recognized as passive screening. Active screening means that the screening is provided to asymptomatic or healthy women in a well-documented program. Based on these definitions, all of the regional and university hospitals as well as the large general hospitals have arranged only a passive screening. The rest of the hospitals have provided both types of screening. However, their activities were neither intensive nor regular. There was only planning without effective implementation. Only one hospital (G6) had a convincing screening.

The target population to be screened was not well defined. The recommendation of the first Pap smears was at the age of 35 or after the onset of sexual intercourse in almost all of the hospitals. One hospital (G5) recommended first screened at the early age of 20. However, the interval of smears is similar, that was annual screening. Nurses were allowed to perform Pap smears in most of the hospitals. Three hospitals (G2, G4, R1) limit this service for only physician. In teaching hospitals (G8, R2, UH, M&C) both medical students and student nurses were allowed to obtain the smears under closed supervision. Vaginal pool, cervix, and endocervix (VCE technique) were the site of cells collection. Ayre spatula with or without cotton tip applicator was used for cells collection. Among these, 4 hospitals (G1, G5, R2, UH) used extended tip Ayre spatula. Fixative agent for cell preservation in all of the hospitals was 95% alcohol.

The women usually were appointed to receive the screening result. The appointed time varied from a week to a month. Physicians had responsibilities to notify the abnormal result. Most of the hospital had no special process to call back the abnormal screened women.

Laboratory Section

Cytological laboratory

Most of the cytology laboratories have existed for more than 10 years. The number of cytotechnician varied between 1-3 per site. In some hospitals these cytotechnicians had

PCU-Primary care unit, CUP-Contracting unit for primary care, CUS-Contracting unit for secondary care, CUT-Contracting unit for tertiary care

Figure 3. Algorithm of the Referral System in Thailand

Table 1. Characteristics of the Target Hospitals in Lower Southern Thailand

Group	Character	Hospital
I	150 beds, 20-60 Ob-Gyn beds, 2-3 young obstetric-gynecologists, C/S rate 18-28%, Gynecological service not available everyday	G1,G4,G6,M&C
II	350 beds, 40-80 Ob-Gyn beds 5 middle age obstetric-gynecologists, C/S rate 30-40%, Gynecological patients 20-100/day	G2,G3,G5,G7
III	500 beds, 80 Ob-Gyn beds, 4-7 middle age obstetric-gynecologists, C/S rate 50%, Gynecological patients 100/day	G8, R1
IV	750-1000 beds, 100 Ob-Gyn beds, qualified gynecologic oncologists, C/S rate 20-30%, Gynecological patients more than 100/day	UH, R2

G = General hospital, R = Regional hospital, M&C = Maternal and Child hospital Region 12 hospital, UH = University hospital

other works besides cytology screening.

The smeared slides were transferred to the laboratory everyday. Most of them were conveyed with fixative agent in specific containers. It took 3-14 days for cytology report. The read slides were storage for 3-5 years before discarding.Data collection was manual, except a few hospitals (G8, R2, UH) in which a computerized system was used. However, the data was accessed freely without a protection system.

The Bethesda 1991 was the most common reporting system. The meaning of abnormal smears was agreed at atypical squamous cells of undetermined significance/ atypical glandular cells of undetermined significance (ASCUS/AGUS) or above. Two hospitals (G1, M&C) defined abnormal smears at the level of inflammation and mild dysplasia respectively.

The quality control of the cytological laboratory was not convincing except in the university hospital. The re-screening of negative smears has been performed in 7 out of 12 hospitals, but the percentage of re-screening was less than 10%. Although most of the laboratories declared that there were formal consultation system, the on-site intensive interview did not confirm that. The consultation depended on personal privilege. Only two hospitals (R2,UH) had a formal consultation system.

Pathological laboratories

There are 3 pathological laboratories in the lower southern Thailand. Two were in service hospitals and the other one was in university hospital. Pathologists in teaching hospital had other responsibilities apart from pathological service. This made them unable to provide pathological service for all other hospitals in lower southern Thailand. The average pathological reporting time in university

hospital was 3-7 days. Other capabilities services were immuno-histochemistry, molecular and viral study. However, during the study period, HPV DNA testing was not available.

All of three pathological laboratories had a computerized data collection, but none had a data protection system. In service hospital, there was uncertainty about the quality control system. In university hospital, the regular academic activities as well as the hospital accreditation process, was able to assure some level of quality control.

Incidence of abnormal Pap smears

The total smears in the year 2002 from the target hospitals was 66 809. The abnormal smears defined as ASCUS or above varied between 0.17-3.15% with a mean of 1.24%(95%CI 1.15-1.32). When focus on high-grade squamous intraepithelial lesions or above, the incidence was 0.36%(95%CI 0.30-0.40). The detail was shown in Table 2.

Management of the abnormal Pap smears

There was no definite guideline for the management of abnormal Pap smears without visible lesion. Repeat smears was the strategy used in equivocal smears as well as the minor abnormalities. The interval of repeat smears varied from immediately to 6 months. AGUS smears, was also managed by repeat smears. Some hospitals recommended random tissue biopsy under naked eye or conization. Only one hospital preferred colposcopic directed biopsy. In smears with mild abnormalities, such as koilocytosis, LSIL(low grade squamous intraepithelial lesion), and mild dysplasia, repeat smears was the most common management option, while some hospitals advised cervical biopsy. Conization was also suggested, and cryotherapy was preferred in one hospital as the management of koilocytosis. In university hospital, the pattern of care was different, every woman with

Table 2. Incidences of Abnormal Pap Smears in Lower Southern Thailand

Hospital	Total smears	Number of abnormal smears(%)	ASCUS (%)	AGUS (%)	LSIL/mild dysplasia (%)	HSIL/Mod. dysplasia /Severe dysplasia/CIS/ suspicious (%)	Positive for Malignant Cells (%)
G1	1577	9(0.57)	4(0.25)	0	3(0.19)	0	2(0.12)
G2	2062	21(1.01)	9(0.43)	0	10(0.48)	2(0.09)	0
G3	7547	18(0.23)	3(0.03)	1(0.13)	3(0.03)	3(0.03)	8(0.10)
G4	3044	96(3.15)	54(1.77)	14(0.45)	16(0.52)	7(0.22)	5(0.16)
G5	2465	8(0.32)	1(0.04)	1(0.04)	1(0.04)	1(0.04)	4(0.16)
G6	1564	19(1.21)	0	3(0.19)	0	4(0.25)	12(0.76)
G7	3561	48(1.34)	8(0.22)	2(0.05)	22(0.61)	10(0.28)	6(0.16)
G8	6172	42(0.68)	0	0	6(0.09)	28(0.45)	8(0.12)
R1	3160	68(2.15)	34(1.04)	15(0.47)	7(0.22)	7(0.22)	5(0.15)
R2	9503	55(0.57)	11(0.11)	1(0.01)	8(0.08)	12(0.12)	23(0.24)
M&C	6670	12(0.17)	0	0	5(0.07)	5(0.07)	2(0.03)
UH	19484	434(2.22)	121(0.62)	55(0.28)	166(0.85)	60(0.31)	32(0.16)
Total	66809	830(1.24)	245(0.36)	92(0.13)	247(0.36)	139(0.20)	107(0.16)
(95%CI)		(1.15-1.32)	(0.32-0.41)	(0.11-0.16)	(0.32-0.41)	(0.17-0.24)	(0.13-0.19)

ASCUS- atypical squamous cells of undetermined significance, AGUS-atypical glandular cells of undetermined significance, LSIL-low grade squamous intraepithelial lesion, HSIL-high grade squamous intraepithelial lesion

abnormal smears since ASCUS or higher abnormalities was sent for colposcopy.

For the major abnormality, high grade squamous intraepithelial lesion (HSIL) or positive smears, most of the hospitals required tissue diagnosis by cervical biopsy, biopsy under colposcopy or conization. However, one hospital still recommended repeat smears in moderate dysplasia. Two hospitals preferred to refer the patient with positive smears to a well equipped hospital.

In a main regional hospital (R2), the loop eletrosurgical excision procedure (LEEP) biopsy under naked eye was the most common method to obtain the tissue diagnosis. For other hospitals, the cervical biopsy under Schiller's test was the method of choice. One hospital had no policy to do the cervical biopsy, the only way to obtain the tissue diagnosis was only by conization. In university hospital cervical biopsy was done only under colposcopy guidance.

Treatment of the pre-invasive cervical neoplasia

Most of the hospitals agreed that conization was adequate for the treatment of pre-invasive lesions of cervical neoplasia. However two hospitals suggest hysterectomy in moderate dysplasia and more severe lesions. In cases with severe dysplasia, or carcinoma in situ, hysterectomy was a common suggestion. Two hospitals had a guideline to follow up these patients. All of the general and regional hospitals had no capability to treat the invasive cancer. All patients were referred to the university hospital.

Conservative treatment was a common suggestion for the pre-invasive stage of cervical cancer in university hospital. Cryotherapy, loop excisional method, laser ablation and conization were used as the methods of choice. The university hospital had a radiotherapy unit to provide the treatment of invasive carcinoma.

Colposcpy clinic

All but one hospital had a colposcope, but only one in all provided regular colposcopy services. The types of colposcopes were optical except in university hospital which was a videocolposcope. The university hospital has provided colposcopy by experienced colposcopists, 4 days per week, with a total cases of 607 per year. There was an informed consent and counseling process before the procedure was done. Reid colposcopic index was used to decrease the variation between each colposcopist. The quality control indicators were also documented and monitored.

Referral system

The university hospital has provided the comprehensive treatment of cervical cancer. It was a destination of the referral system for contemporary management of abnormal Pap smears. The reason for referring the patient with abnormal Pap smears were patient's need, unability to provide the appropriate treatment, biopsy proven of invasive cancer, and for colposcopy. Among 396 cases of abnormal smears, only 4 cases (1.01%) were referred for colposcopy. Although there was no monitoring system, 6 out of eleven hospitals still satisfied the present situation.

Obstacles in providing an effective management of abnormal Pap smears

Using the ranking technique, the obstacles from the viewpoint of the health provider are patients' unawareness , followed by limitation of the service, ineffective administration, unable to follow up the patients, and financial factors

Suggestions

Most of the hospitals agreed that a colposcopic training as well as the conservative management of the pre-invasive lesions was the urgent need to increase the quality of services. Improvement of the cyto-pathological laboratory service was also important. In this aspect, quality control was the key word. Centralization of this service may be the answer. The practical effective guideline for management of the abnormal Pap smears should be set up. The effective referral system should be developed. The cooperation between the hospitals as the network should be emphasized. Certainly, public education was necessary in order to increase awareness of the women.

Discussion

Lower southern Thailand is different to the other parts of the country in that most of the people are muslim. Due to religious and cultural beliefs, the perception of the screening concept especially the genital malignancy may be the barrier to cervical cancer control (Matin & LeBaron, 2004). Although both programmatic quality as well as the technological limitations are the main causes of past failures of cervical cancer screening in developing countries, the latter should be focused to improve (Suba et al., 2004). Lower southern Thailand is similar to the other rural parts of the country in that there is a limitation of resources for health care. Using the limited resources to produce the optimal outcome in cervical cancer screening need the effective utilization measures and well-planned organized program.

Cervical cancer control program in Thailand gets benefits from "Health for All" policy in the aspect that preventive measures is recognized, budget is provided for Pap smears screening, and referral system is documented. Unfortunately when considering in detail of screening process, as well as the management of the abnormal screened women, there are many aspects needed to be improved.

Based on the characteristic of the surveyed hospital, more than half of them have main responsibilities on obstetrics care. Only 4 hospitals in group III and IV have capabilities to provide the contemporary management of abnormal Pap smears. Further study about job analysis as well as the competency of the physicians in these hospital will give the data for human resource development.

The National recommendations for cervical cancer screening as currently given are partly met in most of the

surveyed hospital. To decrease a half of cervical cancer incidence and to reach the coverage rate of 50%, the national recommendation during the study period is screening women by Pap smears at 35-54 years old with 5 years interval. The total number of screened women in the study period should be 427 622. In Thailand the general and regional hospitals are the main places for Pap screening services. If we postulate that all of the Pap smears testing in this study was performed in women with recommended age group, the coverage rate of Pap smears screening in lower southern Thailand was about 15.62%, which is far from goal. The survey about the coverage rate of screening in a defined population in the sample area in the northeast of Thailand found that about 33% of the women have never had Pap smears in their life (Kritpetcharat et al., 2003). However, the method of the study was different between 2 regions of the country.

In the real situation, almost all of the secondary and tertiary care hospitals provide opportunistic screening. Opportunistic screening is known to have limited efficacy with over screening of a minority as an added disadvantage (Insinga, 2004). Although the onset of the first screening is correspond to the National's recommendation, the interval of the screening is more frequent. Despite there is a limited evidence of benefit from more frequent screening, all of the surveyed hospitals recommend annual screening, which will consume a large amount of resources. The views of gynecologists related to the purpose of smear testing and appropriate time intervals for Pap test depend on whether the screened women are regarded as within the category of 'my patients' or 'the population'. This is the result of theirs existence of multiple value systems, applied to different patient populations (Sakadi et al., 2004).

The cervical cancer control program is hardly successful if the Pap smears service was limited to only physician. Due to over workload of physicians in most of the hospitals in Thailand, other non-physicians such as nurses, and mid-wives should participate in cervical cancer screening. In this century, nurses can promote cervical cancer control by advocate screening and improve their training in providing Pap testing (Hilton et al., 2003). Apart from well-trained Pap smear providers, sampling device and the site of collection are important to obtain a high quality of the smears. The pre-cancerous lesion usually occurs at the squamo-columnar junction of the cervix. This area locates at the ectocervix in reproductive women and moves deeply into the endocervix in the postmenopausal women. For this reason, the scrapping at ectocervix and endocervix is necessary in order to obtain a represented cell at the transformation zone. The data from Coccchrane library (Martin-Hirch et al., 2000) showed that extended tip spatulars of various designs appear to be better for collecting endocervical cells than the commonly used Ayre spatula. The most effective device should be the combination of cytobrush and extended tip spatula. Generally in Thailand, modified Ayre spatula was used because of its low cost. The cytobrush was used in specific circumstance, such as in the research project. More than that the cytobrush has to be imported, so it is scarce and more expensive. Thus, extended tip spatula should be recommended to obtain cervical cytology sample.

The recall of patients for their results is one of the disadvantages of the Pap smears screening. The components of the expected process of care in cervical cancer screening should include less time to receive the result, efficient notification process, and clear message about recommendation. These activities are more important in cases with equivocal or abnormal smears. Concerning about result notification process, there was no convincing process in most of the surveyed hospitals. They still relied upon letter appointment, which is an vulnerable process to failure in rural area. Surprisingly mobile-telephone is more available and reliable communication method in Thailand. Many strategies to increase compliance rate to attain screening should be modified to create the efficient notification process. Among these, the combination of letter appointment followed by telephone appointment call, and gatekeeper plans are promising (Eaker et al., 2004; Philips et al., 2004)

The reliable cytology laboratory is one of the minimum requirements of establishing an effective Pap smears screening. Cytology laboratories in the lower southern part of Thailand have tried to practice a mandated methods to measure the sensitivity of Papanicolaou smear interpretation, including the 5-year look back and re-screening of negative smears. However, the read slides were not stored to 5 years in all of the hospitals and the re-screening of negative smears do not reach 10%. Rapid prescreening and automated screening that allow the sensitivity of the method to be measured on a routine basis and a reduction in overall errors (Renshaw, 2003) are not practically feasible in Thailand. More than that, the pathologist is impoverished and there are limited pathological laboratory services in all over the country. This may be the cause of non-convincing formal consulting system in the most cytological laboratories. The professional organization, such as, the institute of pathology, the society of cytologist, and the Royal College of Pathologist should play more active roles in a quality control as well as the continuing education to maintain standard services.

The uniform cytological reporting system and the agreed meaning of the abnormal smears are important section of establishing well-functioning information systems. This system is essential to successful screening program. Fortunately, most of the surveyed hospitals accept the Bethesda reporting system and the meaning of abnormal smears is agreed at the level of ASCUS, AGUS, or above. The under or over perception of abnormal smears in 2 hospitals should be urgently corrected.

The incidence of abnormal smears defined as ASCUS or above in the lower southern Thailand was comparable to population-based study in developed country (Insinga et al., 2004), but less than hospital based study in the neighborhood country of Southeast Asia (Thamboo et al., 2003). Surprisingly the incidence of abnormal smears in the university hospital was stable since 1986. That was about 2.2 % (Chichareon,1986).The incidence of abnormal smears

in surveyed hospital varies between 0.17-3.15%. The lowest incidence comes from the health Promotion Hospital and the highest incidence is found in the general hospital (G4). The variation in the incidence of abnormal smears between hospitals depends on their policy of screening, the expertise of the providers as well as the screening tools, and certainly, the quality of laboratory section. The incidence of abnormal smears in the lower southern Thailand (1.24%) may not be a representative of all abnormal smears incidence of the country because of the decentralization of the laboratories and the variation of population. The inadequate follow-up rate of the abnormal smears in urban population or in developed country was about 30%(Peterson et al., 2003; Safarti et al., 2003). The data from the university hospital showed that 17% of ASCUS smears received repeated smears, 19% was lost to follow up, and 1 % of ASCUS smears did not get any further management (Chichareon & Tocharoenvanich., 2002). Due to lacking of the well-established information system, it was unable to find out the estimated number of women with abnormal smears who received the appropriate management in other hospital in the south.

Lacking of practical guideline leads to over and under management of abnormal Pap smears in the South of Thailand. Although mild abnormalities (ASCUS, LSIL) can associate with a serious pathology (Kobelin et al.,1998; Quddus et al., 2001; Solomon et al; 2001; Chichareon & Tocharoenvanich., 2002; Cheung et al., 2004), HSIL and positive smears should be the first priority to investigation in low-resource setting. Commonly found ASCUS smears can be managed by repeat smears at 4-6 months interval, until 2 consecutive normal smears result are obtained (Wright et al., 2002). The multiple follow-up visits is the important disadvantage of this kind of management. HPV DNA testing which is the suggested triage management in the developed country (Schiffman & Solomon, 2003) is expensive and is not available in Thailand during the study period. Infrequently found AGUS smears has a high association with significant pathology and need comprehensive management. Thus, it should be referred to experienced colposcopist. Because women with LSIL have significant number of high grade lesion on a subsequent cervical biopsy (Lonky et al., 1999; Jones et al., 2000) a colposcopy is recommended for further investigation (Wright et al., 2002). Severe abnormal cytology since HSIL certainly need colposcopy.

Colposcopy is the key management of the abnormal Pap smears. The standard colposcopy clinic should service regularly with the competent colposcopist under quality control. To maintain the competency of the colposcopist, the serviced cases should not be less than 4-5 cases per week, or 20 cases per month. The most important prerequisite for providing colposcopy service is a standard pathological laboratory. All but one in the surveyed hospitals has colposcopy, but only one in all can provide standard service under the referred criteria.

Should colposcopy service be centralized or decentralized in lower southern Thailand? The main advantage of the centralized colposcopy service is that, the patients will have a high possibility to receive the high quality service. The disadvantages are the high workload and patients' inconvenience. The decentralized policy may affect the quality of services and underused of the equipment as appeared in the current practice in the south of Thailand. From general perspective, the practice of local physicians seem to be less costly strategy to evaluate abnormal smears in rural women, but from the medical perspective, their average cost is higher than referral experts because they perform more aggressive procedure than experts (Bishai et al., 2003). This phenomenon seems to be occurred in the southern part of Thailand. Among the surveyed hospitals, the university hospital is the only place that can provide the quality services. Based on the data from this surveyed and define the target female population at the age between 35-54 years old; which include 20% of female population, the workload of colposcopy service at the different level of coverage rate is summarized in the Table 3. Focusing on management only HSIL smears or above with 80 % cover rage of cytological screening, 1231 cases per year need colposcopy. University and some regional hospital which have adequate gynecologist as well as gynecologic oncologist are able to take a work load for colposcopy, in case well organized referral system has been established.

Clinicians in the surveyed hospitals except in the university hospital prefer to treat all grade of CIN and still rely primarily on inpatient methods such as conization and hysterectomy to treat severe grade lesion. These procedures are very costly and can make the unnecessary health's risk to the patients. The preferred management of pre-invasive cervical cancer conditions nowadays is to monitor women with low grade dysplasia and to treat high-grade lesion with less invasive outpatient methods. Among the conservative methods, cryotherapy is a cost-effective procedure to treat CIN II/III in low resource setting. (Klienberg et al., 2004)

Among the secondary and tertiary care hospital in lower southern Thailand, which is a suitable place as a referral center for women with abnormal Pap smears? The referral hospital should have an adequate number of colposcopists, enough equipments, standard cyto-pathological laboratory, support unit/team, and good geographic location. Under these conditions and using a rating scale classification (Table 4.), the university hospital is the most suitable place as the referral center. Another 2 hospitals (G8, R2) have potency

Table 3. Colposcopy Workload in the Lower Southern Thailand at Different Coverage Rates of Screened Women

Coverage	ASCUS or above (1.24%)			HSIL or above (0.36%)		
rate	case/yr	case/m	case/d	case/yr	case/m	case/d
50%	2650	220	10	769	64	3
80%	4240	353	16	1231	102	5
100%	5350	442	20	1539	128	6

ASCUS   - atypical squamous cells of undetermined significance
HSIL   - high grade squamous intraepithelial lesion

Table 4. Rating Scale Classification of the Surveyed Hospitals

Hospital	Physician	Equipment	Geography	Laboratory	Supporting Team
G1	+	+	+	+	+
G2	++	+	+	+	+
G3	++	+	+	+	+
G4	+	+	+	+	+
G5	+	++	+	+	+
G6	+	+	+	+	+
G7	+	++	+	+	+
G8	+++	++	+++	++	++
R1	+	+	+	+	+
R2	+++	++	+++	++	++
M&C	+	++	+	+	+
UH	+++	+++	+++	+++	+++

+++ appropriate, ++ may be appropriate, + inappropriate, lacking
G-General Hospital, R-Regional Hospital, M&C-Health Promotion Center, UH-University Hospital

for further development as referral center.Although rating scale for the equipment, laboratory service, and supporting team may be appropriate, these 2 hospitals have adequate numbers of physician, and the geographic locations are appropriate. Other hospitals should play roles as active screening providers. An improved referral system should be established during the transitional period. In the future, when the 2 hospitals develop as referral centers, the university hospital may change its role to be consultant in complicated cases or provide sophisticated investigations, such as HPV DNA testing. The only inferior aspect of the university hospital is that it is administered by the Ministry of University Affairs, which might have detrimental effects to be the official reference center of the Ministry of Public Health. The renewal referral system is proposed in Fig 4.

Women with an abnormal smears are high-risk group that should be a priority of health services.(Gage et al., 2003) They should receive proper investigation treatment and close follow up. The registration center may do a benefit to this particular group of women. Besides the registration, it will organize the transfer process for these women to the hospital for appropriate management.

To overcome the obstacles in providing an effective management of abnormal Pap smears, provision of information focusing to this particular high-risk group of women is the first priority. The suggestion from the surveyed hospitals delineate the critical successful factors in providing an quality services for management of abnormal smears in lower southern Thailand. These factors include training course for health provider, centralization of the specific service, clinical practice guideline, the effective referral system, and the network formation. It should be responded by the health administrator authorities as well as the health policy makers.

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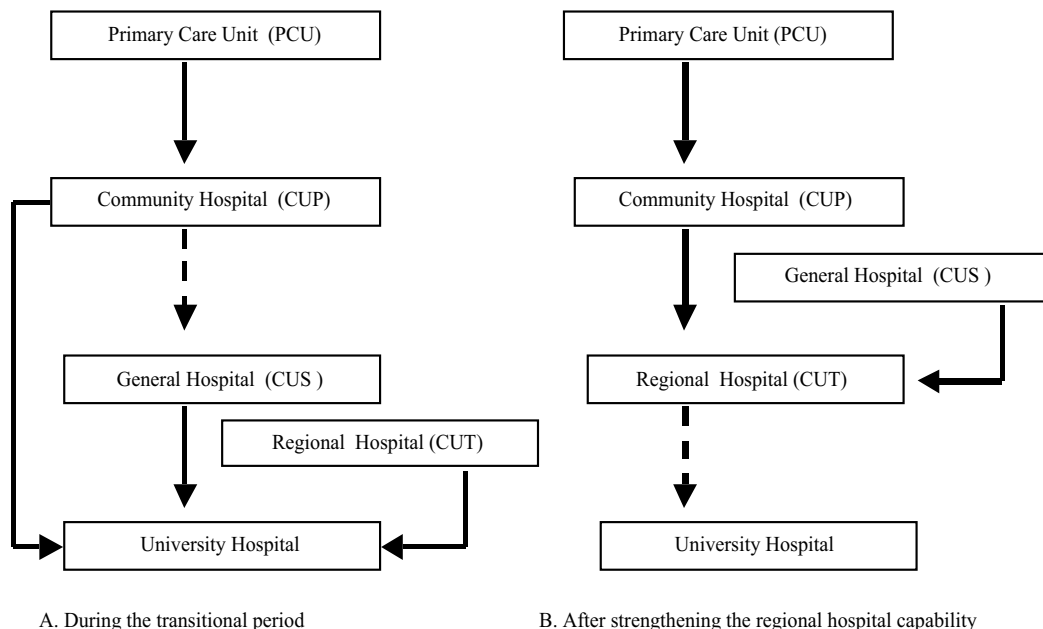

A. During the transitional period

B. After strengthening the regional hospital capability

Figure 4. Algorithm of the Renewal Referral System

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