Cervical Screening in The 21st Century

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Public health screening is moving rapidly in the knowledge that prevention is a cost-effective exercise despite high initial financial outlays. Screening programmes are becoming more sophisticated, particularly in their analyses of cost-effectiveness, but also in areas where new technologies make us re-examine our programmes on a regular basis. Cervical cancer screening is no stranger to this situation. It is clear that any screening programmes have to cater to local cultures, local resources and local politics, and cervical screening in particular in the 21st Century will have many layers and many approaches dependent on the status of the population to be helped.

Cervical Screening in Low-Resource Settings

A number of strategies have been, and are currently being, evaluated in a disparate number of geographical areas, usually of low socio-economic status into alternatives for routine cervical smear screening using the Pap test. These include:

1) Education Programmes About Symptoms

These programmes are aimed at instructing the local community to present to their local care-givers with abnormal symptoms in the knowledge that such an approach will allow down-staging of cancers and thereby improve mortality. The incidence of the disease using this approach, however, will not be changed.

2) Visual Inspection with Acetic Acid (VIA) or Lugol's Iodine (VILI)

These are the most popular research areas currently being evaluated under the auspices of a number of agencies including the UICC. They depend on education programmes to stimulate the local population to attend, trained practitioners - usually nurses - to perform the tests and the availability of practitioners to treat visually abnormal areas using either cryotherapy or if possible diathermy/loop excision. To prove effective, a sizable proportion of the population has to be screened. There has to be built into the programme an evaluation of eventual outcomes. It is often unrealistic to expect to show a reduction in eventual mortality since in most areas initial mortality statistics are unavailable; indeed, in many areas pathological registration of cases is impossible due to a lack of trained staff.

3) Human Papilloma Virus (HPV) Testing

The use of HPV as a primary screen, particularly in women over 35, is an attractive proposition given the sensitivity of the test as a predictor of high-grade abnormality. It is acknowledged, however, that the test is lacking somewhat in specificity as a population screen. It can only be used in areas where secondary follow-up using either cytology/colposcopy/biopsy is available and where sub-sequent treatment is also available. The test, however, can be self-administered and is readily transportable.

Cervical Screening in Developed Countries

Many developed countries have organised Pap smear programmes including, Canada, UK and Australia. It is clear that an organised approach to Pap smear screening is necessary since *ad hoc* testing programmes have never been shown to be effective, and certainly on a population basis cannot be readily evaluated. Current issues around screening include:

1) Screening Intervals

Annual screening, particularly in younger women, is not cost-effective and diverts resources which can be used much more efficiently in other areas. The optimal screening frequency is a compromise and depends enormously on available resources, priorities and community expectation. Certainly, age of commencing Pap smears and finishing Pap smear screening varies enormously from country to country

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and it really is extraordinary that in 2004 we still have a disparate number of recommendations in countries with similar resource settings! It can be safely assumed that screening before the age of 25 will become unusual and that most countries will adopt a strategy of completing screening at age 70.

2) Liquid-Based Cytology (LBC)

The use of LBC has a number of attractive benefits in both developed and developing countries, including a reduction in the number of unsatisfactory smears and the use of the liquid-based medium for other testing including sexually transmitted diseases. Perhaps the greatest benefit rests in the combination of the technology with automated processes which will allow up to four times the number of slides to be screened per day. Given the increasing shortage of cytology technicians this will be of increasing importance in the next 5-10 years. Recent studies from the UK (NICE) have clearly shown a marked reduction in the number of unsatisfactory smears and LBC is currently being introduced nation-wide in the United Kingdom. At this point, Australia is more conservative based on a perception that the number of unsatisfactory smears is less and therefore any cost benefits would be reduced in these circumstances.

3) HPV Testing

(i) Primary screening

Recent UK data suggests that the combination of cytology and HPV testing as a primary screening tool in the older woman is effective and will allow an extension of the screening interval. These preliminary studies have to be validated but conceptually make sense and it can safely be envisaged that this will become the norm within the next 5-10 years also.

(ii) Reflex screening

The use of HPV testing for women with either smears of uncertain significance or low-grade abnormalities to detect high-risk HPV sub-types thereby triaging patients for colposcopy or continued screening is almost with us a routine and probably is a more cost-effect method than the more conservative alternative. Certainly the existence of high-grade abnormalities in women with low-grade smears ranges from 15-40% and anything that expedites colposcopy for those women is to be encouraged.

Other New Technologies

The use of new technologies such as confocal microscopy, the "Polarprobe", and infrared spectroscopy are still being evaluated and have never really been applied in the community setting to date. Any technique which allows scrutiny of the cervix directly without any need for exfoliation of cells is obviously very attractive, but the best technique for low resource settings is obviously one in which the woman can take a sample herself and the sample be subsequently analysed with high sensitivity and specificity.