REVIEW

The Appropriate Use of Diagnostic Services (V) The Effective Use of Cytology Services

By Helena E. Hughes*

INTRODUCTION

The role of cytology in clinical diagnosis and in population screening involves a simple morphological principle. Cellular material from a particular site, whether collected by spontaneous exfoliation or by a mechanical technique such as brushing or fine-needle aspiration reflects, with a surprising degree of accuracy, pathological processes both neoplastic and non-neoplastic occurring at that site at that particular time. The potential of the method for the diagnosis of malignant disease and its precursors was recognised by Papanicolaou and Traut in 1943[1] and this laid the foundation for modern screening programmes for asymptomatic patients and for the diagnosis of symptomatic patients by the examination of exfoliated cells in specimens such as sputum and urine. In the last ten to fifteen years there have been striking developments, which have led to a progressive increase in the demand for the provision of cytology services for the detection and for the diagnosis of disease.

In the United Kingdom cytological screening for 'early' cancer has largely been confined to the search for genito-urinary cancer, particularly cancer of the cervix and bladder cancer. While all the criticisms of cervical cancer screening cannot be answered there is now a general acceptance of the need for screening[2] and for more effective screening.[3,4] This has led to an increased demand, which has recently been exacerbated by concern for the possible effects of the 'Pill', the IUCD, the risks of Herpes Virus and Human Papilloma Virus infection and by the suggestion that there might be an impending epidemic of carcinoma of the cervix.[5] In the diagnostic field the demand is growing for different reasons. Technical developments have enormously enlarged the scope of cytology. At a time when there was already increasing acceptance of the validity of a diagnosis made by the fine-needle aspiration biopsy technique, the advent of imaging techniques in conjunction with fine-needle aspiration extended the areas to which the method was applicable to include a wide variety of deep-seated lesions. Similarly the use of fibreoptics in endoscopy allowed the cytologist to collect diagnostic specimens from many previously inaccessible sites. The benefit to the patient and the economic advantages of these minimally invasive techniques have led to a steady growth in clinical requests for diagnostic cytology.

This increased demand for screening for diagnosis has put many laboratories under considerable pressure. While the basic principle of diagnostic cytology is simple, accurate results depend on skilled subjec-

Department of Cytology,
Royal Infirmary, Glasgow

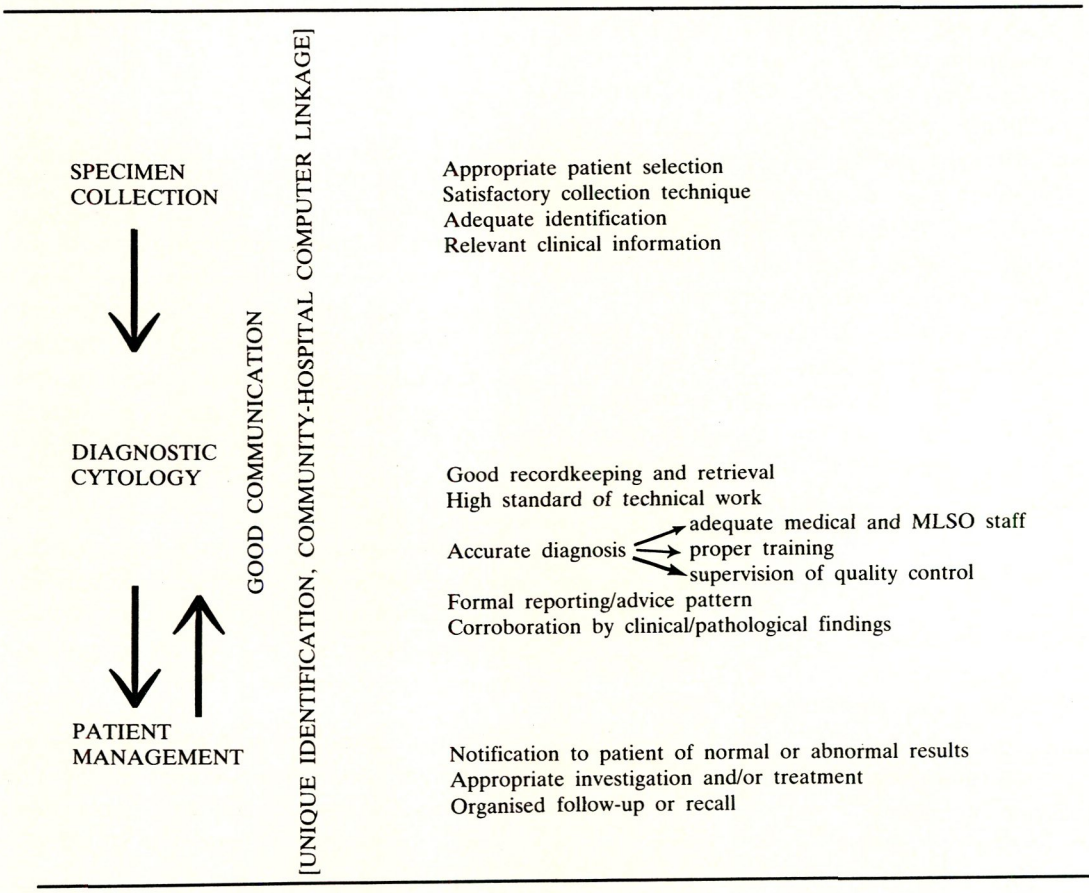
tive interpretation of morphological appearances. Resources are therefore limited, not only by cost but by the availability of skilled staff, particularly medical staff to provide adequate training and supervision.[6] Until adequate resources and staff are available to provide a more extensive service, effective use of present laboratory services is the only way to avoid overstretching the cytology laboratory with the inevitable sequelae of delayed reports and falling standards of accuracy. Effective use can be achieved by what may be thought of as the three C's: — co-operation, comunication and correlation.

CO-OPERATION

Diagnostic cytology has always had strong links with clinical care and it is of fundamental importance that these should be maintained and strengthened. A clinician using the service should have ready access to the cytopathologist to discuss the selection of the appropriate investigation. The importance of this has been recognised by the Royal College of Pathologists in its recent recommendations on the Management of Pathology Departments in the National Health Service.[7] The clinician offering a screening service is generally involved in primary care, whether in the family practitioner service or as a community physician or in industrial medicine. He should be aware of the importance of securing a high response rate from the target population at maximum risk, if the best use is to be made of laboratory resources. If he offers a screening test to a patient he must recognise that this, in itself, implies that the test has value. It is therefore just as important as with a clinical case to ensure that a specimen is properly collected and is despatched to the laboratory with any relevant history. He must also be aware that screening cannot exclude a disease and should therefore never be allowed to override clinical suspicion. In cervical cytology the 1982 recommendations of the DHSS Committee on Gynaecological Cytology,[8] updated in the 1984

TABLE 1

Requirements for an effective cytology service



DHSS Circular,[9] rightly emphasised the importance of a positive approach to women over thirty-five, who have never had a smear, and of routine five yearly screening of both younger and older women, if they are sexually active. These guidelines provide a basis for a routine screening policy, but successful implementation of the policy demands from the clinician further co-operation with the laboratory. He should ensure that repeat smears requested are obtained and that patients for whom referral for colposcopy or a gynaecological opinion is advised are actually referred.[10] Conversely the clinician should try to avoid unnecessary 'routine' repeat smears. An outline plan for an effective cervical cytology service is shown in Table 1.

The cytopathologist can help to secure the efficient use of the laboratory by the clinician, for screening purposes, by making sure that the clinician knows exactly what is required for a 'satisfactory' specimen, for example the presence of endocervical cells in a cervical smear from a woman in the child-bearing years. He must also be willing to discuss with his clinical colleagues any difficulties which may arise over collection techniques. It is important that the laboratory report should make clear to the clinician what has been found and precisely what action is required.

When we come to the symptomatic patient, co-operation between the clinician, the cytopathologist and the histopathologist, where this is a different person is of fundamental importance. From the clinical history, the physical findings and the results of any other tests which may be available, the clinician can decide which specimen or specimens would be most suitable for cytological diagnosis and at what stage in the investigation cytology would be most helpful. The advantages of a rapid result and a minimally invasive technique may make the choice readily apparent, for example early investigation by fine-needle aspiration cytology of a superficial lump, perhaps in breast or in a salivary gland, may expedite or avoid surgery. In other cases, such as the respiratory tract, as shown in Table 2, the choice may depend on whether the disease is general or localised, on an assessment of the risk involved in the investigation, and on the facilities locally available. Some patients may well require a combination of several cytological methods. A request for cytology to 'exclude' a particular diagnosis is unrealistic since positive findings depend on the accessibility of the lesion and the adequacy of sampling. On the other hand cytology may still have a contribution to make when a positive diagnosis has been established by other methods, since it may add valuable information on tumour typing. Where there is any difficulty in selecting the most appropriate investigation, discussion of the case with the cytopathologist is desirable.

For his part, the cytopathologist should appreciate the problems of this clinical colleagues. The laboratory must recognise that early reports are valuable in expediting admission, in shortening the patient's stay in hospital and in minimising further investigation. As far as possible the laboratory should try to avoid equivocal reports. Occasionally these are

TABLE 2

Cytological investigation of the respiratory tract

SPECIMEN	ADVANTAGES	DISADVANTAGES
SPUTUM	Painless. Simple. Cheap. Good sampling of both lung fields.	Specimens often unsatisfactory. Relatively low yield of abnormal cells. No localisation.
BRONCHIAL ASPIRATE, LAVAGE OR BRUSH BIOPSY	Higher yield of abnormal cells. Localisation possible	Uncomfortable ... needs analgesia or anaesthesia. Skilled technique ... expensive. Sampling error increased.
TRANS-THORACIC OR LYMPH-NODE FINE-NEEDLE ASPIRATION BIOPSY	High yield of abnormal cells. Good localisation.	May be clinical complications. Uncomfortable. Skilled technique. Sampling error increased.

unavoidable because of an inadequate specimen or a diagnostic difficulty. When a specimen is really inadequate it is wiser to explain to the clinician that this is unsatisfactory for diagnosis. Where there is a problem in diagnosis, discussion with the clinician and the suggestion of further lines of investigation are far more valuable than a 'suspicious' report.

COMMUNICATION

Communication with and about patients occurs at two different levels. First there is the purely personal basis of communication with an individual patient or about a problem patient by clinical and laboratory colleagues. On a different scale, but with many of the same problems, there is the question of communication about the anonymous patients who pass through screening programmes or constitute routine clinical cases. For all these patients accurate identification by full details of name, address, and date of birth together with some form of unique number is essential. It provides the basis for the laboratory record and record retrieval system. Computerisation of family practitioner service records and of hospital records can only make proper identification more important, if efficient linkage is to be achieved. The clinician must therefore ensure that all the appropriate details are completed on request forms. He will, of course, provide the relevant clinical history but may not appreciate that it is important that he should include details of treatment received and of previous cytology and pathology reports. At the same time he should check that the identification of the specimen corresponds accurately with the data on the request form.

The laboratory may need to send reports to several people. In the first instance a report would obviously go to the clinician requesting the investigation. However it may be helpful, by local arrangement, to send copies of the request to other clinical colleagues. For example, it may be agreed that copies of cervical smear screening test reports on patients seen at local authority clinics will also be sent to their own general practitioner. Since the laboratory does not communicate results directly to the person who has been screened, the responsibility for ensuring that she is aware of the result of the test lies with the clinician. This is not likely to be a problem with the symptomatic patient or when the findings on a screening test are abnormal. However, not all women who have been screened are made aware of the negative result of the screening test, such as a cervical smear, and arrangements should be made to ensure that they also received the test result.

CORRELATION

Every laboratory is anxious to maintain high standards of accuracy in diagnosis. The cytopathologist is particularly aware that a false negative report may lull the patient and possibly the doctor into an acceptance of suspicious symptoms or signs. Similarly the cytopathologist knows only too well the danger of unnecessary investigation or even surgery as a result of a false positive report. While some incorrect result can be attributed to unsatisfactory specimens or inadequate sampling, others are undoubtedly due to errors in interpretation in the laboratory.[11] The fundamental requirements for accuracy in interpretation are properly trained staff working under adequate supervision to maintain a high standard of internal quality control. External methods of quality assessment are being examined in pilot studies.[12] There remain a number of difficulties in this latter approach, not least being that of providing identical specimens. Each laboratory will have its own system of monitoring results by random sampling, by peer review and by correlation with histopathology. To this the clinician can make a valuable contribution by letting the laboratory know the final diagnosis. This is particularly important when the final diagnosis differs from the provisional diagnosis made by the laboratory. The clinicopathological conference provides a forum in which this information can emerge. If this is not appropriate, the clinician should feel that the laboratory welcomes follow-up information on patients and that this is just as true when the final result differs from the laboratory diagnosis as when it vindicates the laboratory.

CONCLUSION

If the cytology service is to make a vauable contribution to the detection of unsuspected disease and to the diagnosis of both neoplastic and non-neoplastic clinical conditions an excessive demand on laboratory services must be avoided. The service will be used most effectively when all concerned are able to work closely together in planning the selection of

patients for screening services. In the diagnostic field the clinician and cytopathologist must co-operate in selecting the most appropriate cytological investigations for clinical problems and in planning the further investigation and treatment of diseases identified by the laboratory.

REFERENCES

1. Papanicolaou GN, Traut HF. Diagnosis of uterine cancer by the vaginal smear, New York: Commonwealth Fund, 1943.

2. Draper GJ, Cook JA. Changing patterns of cervical cancer rates. Br Med J 1983; 287: 510–512.

3. Chamberlain J. Failures of the cervical cytology screening programme. Br Med J 1984; 289: 853–854.

4. IRCF Co-ordinating Committee on Cervical Screening. Organisation of a programme for cervical cancer screening. Br Med J 1984; 289: 894–895.

5. Wolfendale MR, King S, Usherwood MMD. Abnormal cervical smears: are we in for an epidemic? Br Med J 1983; 287: 526–528.

6. Hudson EA. Report on the survey of pathologists practising cytopathology. Bull Roy Coll Pathol 1984; 45: 9–10.

7. Royal College of Pathologists. Management of pathology departments in the National Health Service. London: Royal College of Pathologists, 1984.

8. Draper GJ. Screening for cervical cancer: revised policy. The recommendations of the DHSS Committee on Gynaecological Cytology, Health Trends 1982; 14: 37–40.

9. Department of Health and Social Security. Screening for cervical cancer. London: Department of Health and Social Security, 1984. (Health Circular. Health services development: [HC(84)17] [HC(FP)(84)8].

10. Elwood JM, Cotton RE, Johnson J, Jones GM, Curnow J, Beaver MW. Are patients with abnormal cervical smears adequately managed? Br Med J 1984; 289: 891–894.

11. Paterson MEL, Peel KR, Joslin CAF. Cervical smear histories of 500 women with invasive cervical cancer in Yorkshire. Br Med J 1984; 289: 896–898.

12. Husain OAN, Butler EB, Woodford FP. Combined external quality assessment of cytology and histology opinions: a pilot scheme for a cluster of five laboratories. J Clin Path 1984; 37: 993–1001.