PRINCIPLES OF SCREENING FOR CHRONIC DISEASES

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INTRODUCTION

Screening is a form of prevention which usually applies mainly in chronic diseases rather than in acute sickness. Screening is a form of secondary prevention, not a primary one. Primary prevention means avoiding the disease altogether while screening for a disease assumes that the disease is already there and finding it early in a non-symptomatic state is better than when it is symptomatic. In order to have a successful control, the disease must be suitable and then you have to have a suitable test and the programme must be appropriate.

DISEASE

Not all diseases are amenable for screening. The disease must be of public health significance. An example is cancer of the cervix in this country. This is because it is the most common cancer among women. The disease must be chronic in nature. There is no point screening for an acute problem which is already rapidly progressing. It should receive curative measures immediately. The disease must have a pre-clinical phase. Pre-clinical phase means that the disease is present but is not symptomatic. However, this pre-clinical phase must be detectable. Cancer of the cervix has a pre-clinical phase of dysplasia and that dysplasia is detectable. It is also important that once the screening method has detected the disease, then there must be curative intervention. There is no use of detecting a disease which cannot be managed. Above all, the disease must have a known natural history. This must have been empirically established. If carcinoma of the cervix is taken as an example, it is known that dysplasia usually progresses to carcinoma in-situ which subsequently becomes invasive cancer and then a metastatic disease. This leads to death. The natural history is therefore established and the screening is useful in interrupting this trend and even stopping it.

TEST

If the disease you are screening for is suitable, the test itself must also be suitable. It must be simple and cost-effective. It must be non-invasive. It must also be acceptable to the population. If we take for example, Pap smear, which is very simple and is non-invasive and, to most populations is acceptable. It must be stated that in some populations, especially in some religious circles, Pap smear is not an acceptable procedure. These populations cannot have control of the disease. It is also known that the test may be multiple and does not have to be single. The tests must have high sensitivity and high specificity. The meaning of these two terminologies usually are not understood. Sensitivity means; 'how well does the test pick up people with disease'. If there are 100 people who already have the disease, a test which picks 98 of those people is very sensitive. However, a test which just picks up 50 is not very sensitive. Specificity usually means, 'how well does the test leave out those without the disease'. If there are 100 people without the disease and the test leaves 98 of them out, the test is very specific. However, if the test only leaves out 50 people of those without the disease, the test is not very specific. The test also should have high positive predictive value and also very high negative predictive value. High positive predictive value means that among those people, who have tested positive, who among them have the disease. The negative predictive value asks among people who have tested negative, 'What percentage of those do not have the disease?' Diagnostic tests must also be available after the screening test. Our now famous example, the Pap smear, is a screening test for cancer of cervix. Colposcopy and biopsy are corresponding diagnostic tests. A screening test must never be used in place of diagnostic test. A patient who is admitted to the hospital with a mass in the cervix and who is also bleeding should not have Pap smear done. A biopsy must be done immediately.

PROGRAMME

Once you have set a suitable test in appropriate disease, amenable for screening, the programme must be cost-effective. The programme also must be acceptable and there should be a measure of deciding whether the programme is successful or not. The programme must not only be evaluated at an early stage but also at later stage. Usually, the measure for a suitable programme is 'years of the life saved'. The short-term benefits must be measured against the long-term benefits. In this way, screening then is seen as the way of controlling the disease. Examples of chronic diseases where screening is used for prevention are: diabetes, hypertension, TB, cancer of breast, cancer of the cervix and malignant melanoma. At times we use screening for chronic problems as a means of getting into the health-care system.