Health Technology Assessment of Population based Screening for Type 2 Diabetes & Hypertension in India

Health Technology Assessment in India (HTAIn)
Department of Health Research

POLICY BRIEF

Background

The present study involved Health Technology Assessment of population-based screening for diabetes and hypertension in India. A systematic review and meta-analysis was undertaken to assess the diagnostic accuracy of screening tests in previously undiagnosed population. Primary data was collected using standard bottom-up costing methods, from Haryana and Tamil Nadu states, to assess the cost of screening. The National Health System Cost Database was used to determine the cost of diagnostic tests as well as the health system cost of treatment for diabetes and hypertension. The cost of treating complications in tertiary care setting was obtained from the Cost of Health Services in India (CHSI) study. Out-of-pocket expenditure for treatment in public and private sector was assessed by analysing the 71st round of National Sample Survey data on Health and Morbidity. Primary data was collected from 954 patients to assess the OOP expenditure in tertiary hospital and quality of life among those affected with diabetes, hypertension, co-morbidity, as well as different complications.

A hybrid decision model comprising of 3 parts was used to assess the incremental cost per quality adjusted life year (QALY) gained as a result of screening. The first part comprised of the decision tree which predicted the number of individuals who would be detected with either prediabetes, diabetes, hypertension, and a co-morbid state. These cases were further classified into true positives, false negative, true negative and false negative based on sensitivity and specificity of screening methods. The second part used a Markov model to track the transition of diseased individuals over annual cycles to identify occurrence of disease-related complication. The third part comprised of five separate Markov models for the complications (retinopathy, nephropathy, foot ulcer, coronary heart disease, stroke) which predicted the life course in terms of life years, QALYs and costs. Several alternative screening scenarios were considered depending on the methods used (random blood glucose, fasting blood glucose), frequency of screening (annual, every three or five or ten or fifteen or twenty years and one-time) and population age group to be screened (30-65 years or 45-65 years).

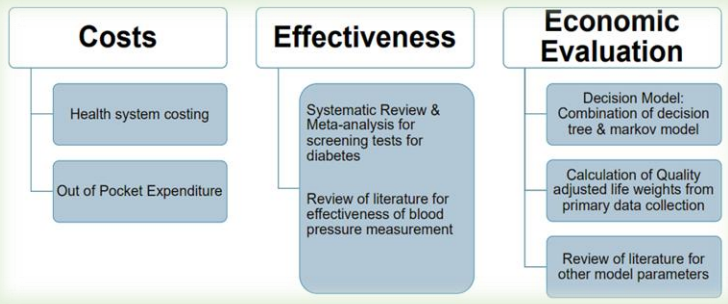

Figure 1: Process of HTA conducted

Conclusions

In summary, we report on the current scenario of PBS implementation and explored on the health system challenges and opportunities in regard to the existing program. Given the escalating dual burden of DM and HTN, and the current challenges noted in the provision of PBS program, there is a need to focus on addressing the same for providing quality services to patients with effective strengthening of primary health care. However, there is little empirical information about the benefits of such population based screening within current health care systems in developing countries.

Key findings

1. In the absence of screening, there are 9267, 28,206, 2982, 3030 and 1239 cases of stroke, myocardial infarction, end stage renal disease (ESRD), amputation and blindness due to diabetes and hypertension per 1 lakh population respectively. With the implementation of annual population based screening with random blood glucose test followed by fasting glucose test (as compared to no screening), there is reduction in 23% (n=2123), 13% (n=3753), 27% (n=807), 40% (1224) and 35% (n=429) cases of stroke, myocardial infarction, end stage renal disease (ESRD), amputation and blindness per 1 lakh population respectively.

2. In the scenario of no screening, for a cohort of 1 lakh population, the lifetime treatment cost of complicated cases comprised of around 96.5% (INR 7794 million) of the total cost, followed by cost of treating uncomplicated cases (3.37%; INR 271 million). In the case of annual screening, treatment cost of uncomplicated cases constitutes the major component (64.5%; INR 10929 million), followed by the cost of treating complicated cases (35%; INR 5980 million). The cost of implementing screening comprised of 0.5% (INR 65 million) of the total cost.

3. Implementation of annual population-based screening with random blood glucose test followed by fasting glucose test (as compared to no screening), lead to gain in 6387 life years, 19,656 quality adjusted life years and reduction in 1259 deaths (due to diabetes and hypertension) per one lakh population respectively.

Policy Recommendations

This study explored potential health system challenges and opportunities that need to be considered for PBS from the health system perspective. There are potential challenges existing in various aspects of PBS; however, some focus areas as opportunities were also recognized:

- Improving coverage rates for screening, subsequent referral for confirmatory testing and put on treatment.

- Focussing on follow up of those who started on treatment and how to achieve control for the disease conditions.

- Assessing cost-effectiveness of annual screening.

- Assessing on screening for complications.

- Promoting the prevention programs and increasing awareness for diabetes and hypertension.

- Improving the reporting formats to avoid the multiplicity in reporting.

- Functioning of NCD clinics to ensure early treatment.

- Incorporating formats that facilitate in capturing data regarding incidence and can be of subsequent policy use.

- Understanding the PBS with equity lens to assess any improvement in access to vulnerable populations.

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