Volume : 2 | Issue : 8 | Aug 2013

Research Paper

Medical Science



The assessment of family physicians' performance in screening of Hypertension and Diabetes mellitus

* S tayebeh hashemi **Elham farrokh siar *** Reza khadivi

* Family Physician, Mazandaran University of Medical Sciences , Ramsar, Iran

** Family Physician, Lorestan University of Medical Sciences. Aligudarz , Iran

*** Corresponding author. Community Medicine specialist, Social Determinants of Health Research Center, Isfahan University of Medical Sciences, Isfahan, Iran

ABSTRACT

Background: Family physician(FP) program as a part of health sector reform(HSR) is performed in rural areas of I.R.Iran from 2005. The aim of this study is to evaluate the FM performance via the diseases screening such as hypertension(HTN) and diabetes mellitus(DM) in 5 years after introduction of this program.

Method: This is a cross- sectional study that was done, in rural health centers in Isfahan district, (in central of I.R Iran) at 2011. FPS have screened covered population. We collected data from patients' health records that have been diagnosed as HTN and/or DM. we gathered data including demographic variables (age, sex, job), and the date in that definite diagnosis has been occurred.

We assessed the efficiency of HTN and DM screening via the comparison between the estimated patients who resided in rural area of Isfahan district and the number of patients whom have been fulfilled health records in rural health centers.

Result: In comparable with the prevalence of HTN and DM in such population in this area, FPS have diagnosed the 31.5 percent of hypertensive patients and 55% of DM patients. The proportion of screen-detected diabetes in the over 25 years old general population was 3.7% while the proportion of screen-detected HTN in the over 25 years old general population was 7%.

Prior to 2005(HSR implementation), 41% of all hypertensive patients were diagnosed, whereas, after HSR implementation, 59% of all hypertensive patients were diagnosed. Also 28.2% of total DM patients were discovered prior the HSR implementation. Whereas, after HSR implementation, 71.8% of total DM patients have been diagnosed.

Conclusion: In rural areas which FP program has been implemented, HTN and DM screening were improved.

Keywords : Health sector reform, developing country, Case finding, Diabetes mellitus, Hypertension, Iran.

Introduction:

Hypertension(HTN) is the most common cardio vascular disease. It affect at least 600 million people in the world, and has an important role in cardiovascular mortality and morbidity. Approximately, 15%–37% of the adult population is affected by HTN. Unfortunately, most hypertensive patients are unaware that they are suffered. However, the detection and control of HTN exists a challenge particularly in developing countries(1).

The prevalence of type 2 diabetes mellitus (DM) is exceeding markedly. Approximately, 173 million adults have been affected from DM in 2002. Around two thirds of these live in developing countries. Unfortunately, only 50% of diabetic patients are known to have the disease. It has been suggested, that earlier detection of DM will delay the risk of chronic and irreversible complications. Thus high risk population must be screened for DM on a regular basis. The American Diabetes Association (ADA) have suggested screening of middle-aged normoglycaemic population at every 3 year intervals (2).

In Iran,in 2005, 20 percent of men and 17.3 percent of women were suffered from hypertension, as mean of 18.6 percent overall . In such time, 3.1 percent of population in urban areas and 1.9 percent of population in rural areas, have had DM(3).

The prevalence of hypertension in over 25 y/o in Isfahan district was %22.2, while the prevalence of diabetes mellitus in over 25 y/o population of Isfahan district was 6.6% (4).

After Islamic revolutionin1979, widespread access to health providers networks was carried out These health networks that were based on primary health care , have offered great development in health status of all citizens, particularly in remote areas (3).Following epidemiological transition from communicable to non-communicable diseases in Iran in 2 last decades, it would paid more attention to prevention and control of such diseases. Thus national mass campaign about complications of hypertension and diabetes mellitus and screening of these diseases in high risk population were implemented in 1996 and 2004 respectively (5).

However, because control of these diseases need longtime patient following up ,Health sector reform(HSR) carried out in Iran in 2005,scoping improvement equity for patient access to health care particularly from economical view and increasing responsibility and accountability in health providers. According to this policy, FP_s as health gatekeeper were provided health cares upon benefit package for approximately 2500 to 4000 persons and refer patients to specialists in via referral system. All people in rural areas and urban areas under 20000, have favored insurance coverage. In this program, the payment mechanism for FP has based on capitation(6).

 ${\sf FP}_{\rm s}$ should have to visit all covered population at first year after implementation of the health sector reform program.

Furthermore FPs would have to screen high risk population from diseases with upper priorities such as hypertension and diabetes mellitus with no discrimination against community minorities from sex or age viewpoint, or socio-economical situation or risk of disease, in appointment interval. Patients who seek FP visits, they have to pay 10 % of visit fee as co-payment. Moreover, the FP_s must be to record any action that is performed in patients health records.(6)

HSR in I.R. Iran contain changing in different part of health system such as financing, payment system and other factors scoping to improvement of patients access to health care. Health assessment of covered population and screening the at risk people from cardio vascular disease such as DM and HTN every 3 years, are likely more important FP_s roles in provision of health cares. Naturally, monitoring of performance of FP_s in screening of HTN and DM, could be a key for assuming the effect of HSR in rural areas (7) According on the ADDITION-Europe study, population-based screening for DM is feasible (8).

The target of this study is to assess the FP_s performance in chronic non-communicable diseases screening such as HTN and DM after 6 years of HSR in I.R Iran.

Methods:

This is a cross- sectional study that was done, in rural health centers in Isfahan district, at 2011. Isfahan district is located in Isfahan province in central of I.R Iran. We collected data from patients health records whom have been diagnosed as hypertension and/or diabetes mellitus, in 16 rural health centers, where FP_s have screened covered population. From patients health records, we gathered data including demographic variables (age, sex, job), date of first visit and/ or follow up by family physician, the date of definite diagnosis of their diseases es and the values of the last fasting blood sugar in diabetics mellitus and blood pressure in hypertensive patients.

The number of over 25y/o population in rural areas of Isfahan district's are 45828 person. If the prevalence of HTN in over 25 y/o in Isfahan district would be %22.2 (4),thus the number of hypertensive patients who reside in these areas, would be estimated as 10174 persons.

In otherwise, if the prevalence of DM in over 25 y/o population of Isfahan district would be 6.6% (4),it would be approximated that the number of diabetic mellitus patients in this population are 3025 persons. We assessed the efficiency of HTN and DM case detection that have been performed by FP_s, via the comparison between the estimated patients who reside in these areas and the number of patients whom have been fulfilled health records in rural health centers of Isfahan district. Data have been entered in computer by SPSS.18.software and analyzed by Chi -Square and T test.

Results:

To 2011, 3209 hypertensive patients and 1684 DM patients were registered in rural health centers in Isfahan district, and followed up by FP_s . The proportion of screen-detected diabetes in the general population was 3.7 percent while the proportion of screen-detected HTN in the general population was7 percent. More registered patients either hypertensive or diabetic patients, were women (Table-1).

More than 62% of all screened patients were housekeeper .The remainder have another jobs that work in villages.

The range of hypertensive patients age was 26 to 90 years old (the mean of age was 64.2 ± 1.3). The mean of systolic blood pressures that have registered, were 156 ± 6.85 mmHg ranging from140 to180mmHg. Registered diastolic blood pressures were ranged from 80 to 120 mmHg (The mean of diastolic blood pressure was 99.6 ± 6.37 mmHg).

The age of DM patients was ranged from 13 to 93 years old. The mean age of DM patients was 57.9 ± 1.31 years old. More

diabetic patients (30%) at diagnostic time were in range of 50-59y/o. Among DM patients, fasting blood sugar was ranged from 100 to 402 mg/dl (the mean fasting blood sugar was 208±3.99 mg/dl and the median was 201mg/dl).

point of view of the efficiency of HTN screening programs in different intervals, prior to 2005, 1316 hypertensive patients (41% of all hypertensive patients) were diagnosed and registered, whereas, after 2005(after health sector reform program was implemented), 1893 persons of hypertensive patients (59% of all hypertensive patients) were diagnosed (Table-2).

The numbers of hypertensive patients that were discovered and were registered in rural health centers in Isfahan district were 3209 patients. Based on the prevalence of HTN in this area, now in rural health centers, approximately 31.5% of hypertensive patients were detected.

In this study, 1684 diabetic patients were identified totally, while, 475 DM patients (28.2% of total patients) were discovered and registered from diabetes screening program prior to 2004. Whereas, 1209 DM patients (71.8%), have been diagnosed after 2005 (after health sector reform program was implemented)(Table-4). The number of over 25 years old DM patients that have cared and followed up with FP_s in Isfahan district rural areas were 1660 patients. Based on the prevalence of DM in this area, now in health center, approximately 55% of DM patients were detected.

Discussion:

After health sector reform(HSR), the percent of hypertensive patients that have detected in rural health centers, raised from 41% to 59%. In otherwise, overall 31.5% of hypertensive patients that have resided in these areas, were detected. The detection rates in most developed countries range from 32%–64%, while in many developing countries the detection rates are obviously lower (1).

The proportion of screen-detected diabetes in the general population was 3.7 percent. However the proportion of screen-detected diabetes in the ADDITION-Europe study ranged from 0.33 to 1.09%(8).

The prevalence of undiagnosed diabetes in patients older than 40, in a Canadian study was 1.4%(9).In another study, in the 3-year period, the overall yield, in terms of patients screened, was 2.0%(10).

It seems HSR program particularly in rural areas in a developing country may perform a good opportunity to develop case finding of non-communicable diseases as in developed countries.(1)

However, the measurement of blood pressure in the Canada was performed at least 71%-79% of population in the last five years(11,12).

Also, after health sector reform, the number of diabetic patients that have detected in rural health centers, raised from 28.2% to 71.8%. In otherwise, overall 55% of diabetic mellitus patients that have resided in these areas, were detected. The response to a diabetes screening programme, it is varies from 30% to 80%(2). Inversely in **Diabetes Screening in Canada** (**DIASCAN)Study**, greater proportion of new diabetes that was discovered were from rural areas(13).

Similarly, it could be emphasized that after HSR program and FP_s interventions in health care delivery system as gatekeepers ,we could achieve to preceding aims substantially after epidemiologic transition in filling the gap between different communities in detection and in future the control of non-infectious diseases(2).

In the Costa Rica, during the one year, 89% of population has been measured their blood pressure and 75% have been screened blood glucose. So 48% of HTN and 21% of

DM have been diagnosed by physicians(14).

Because of the asymptomatic and progressive nature of the chronic and non-reversible complications of HTN and DM, these findings assume the well organized FM screening program. Furthermore early diagnosing and continuous cares, could be improve patients health outcomes.

The prevalence rate of DM and HTN in rural areas of I.R.Iran were likely fewer than those prevalence rate in urban areas (5). Therefore lesser screened DM and HTN patients in rural areas in this study, could be suggested the lower prevalence rate of DM and HTN in these areas. There are almost twice as many diabetics in the urban population (3.1 vs. 1.9 percent) than in the rural population(3).

Because after implementation of HSR in rural areas, rural citizens would be thankful because for every 2500-4000 population, there is a FM and axillaries staff additionally, FM visit and laboratory user fee's were decreased from 100% to 10 - 30%for visit and laboratory fees respectively (6).Thus these policies got rid physical and economical barriers for all patients in rural regions.

In pilot study that carried out in Niger in 1989, in district that persons paid a small fee-per-episode in public health facilities, the number of initial visits increased by nearly 40%, and significant improvement was observed in the utilization of public health facilities among children and women. (15) These values are similar with the results of our study, emphasizing that after decline user fees for patients it would be increase the number of visits and would be observe development in screening of diseases.

Many HTN and DM patients because good geographical or economical access to specialists, directly go to secondary or tertiary health cares services in urban areas. These patients have been awarded from HTN and DM after mass education campaign in recent years, but consult with specialists directly and rural health centers have not gathered their medical histories completely. In study that have was performed with S-lebaron and H.Schultz on FM program in Iran, they suggested that many patients because lake of confidence to general physicians, they prefer to receive health cares even for common health complaints from specialist physicians (16). However in Ontario, three-quarters of people with DM take their DM care from FP only.(17). Thus it seems the total screened patients in rural areas would be higher than those data that collected and the efficiency of FPS interventions assume to be too more.

In this study, 67.2% of DM patients, are women. As according on Maarasi and another studies, the prevalence of DM are likely more in women than men (3.6 % versus 2.6% respectively) (4,5). Such results could be saw from Diabetes Screening in Canada (DIASCAN) Study, in that of the 8,863 patients for whom sex was recorded, 51.9% of patients were female and 48.1% male(13). It seems the life style pattern in women particularly obesity and lack of exercise would be the most common risk factors that address to frequency of DM in Iranian women.

In this study, 72.71% of HTN patients are women. According on Maarasi and another studies, the prevalence of HTN are likely more in women than men(4), Whereas upon another past study in 2005 in Iran, HTN was more prevalent in men than women(20 % in men and 17.3 % in women)(3).

General physicians and other auxiliaries' staffs in health centers have awarded population via mass educational campaign or during office visits. These interventions has been caused to increase HTN and DM case finding, passively, Perhaps, more case finding of HTN and DM in women, could be demonstrated women's emphasis on their health status. Similar scenario would de discovered from Canadian study where following family Physician screening for HTN,

9.6% of females versus 8.9% of males have suffered from HTN (18).

Additionally, it could be supposed that high frequency of DM in women(that is seen in majority of Iranian studies) may cause rising the frequency of HTN in this group(in contrast by the results of many other studies that the prevalence of HTN in whom is more in men).

Otherwise national studies were performed with accurate sample size and have upper validity. However our study is based on registered patients that have detected passively and have related with patients' attitudes and performances.

Conclusion:

Following implementation of health sector reform as family physician program in I.R. Iran, it extended health insurance coverage in all rural areas and urban areas (below 20000 populations) and declined user fees. These facilities favored access for poor population. Following those policies, case finding particularly HTN and DM, have been developed.

Acknowledgment:

We wish to thank the health staffs of Isfahan District health Centers (administrators, general physicians, experts and axillaries workers particularly behvarzes). Also we would like to thank the Research and technology Affair of Isfahan University of Medical Sciences that supported this study economically.

Table1: The hypertensive and diabetic mellitus patients
that have been detected via the family physicians screen-
ing in rural areas in I.R.Iran at 2011.

Sex Disease	Female	male	total
hypertension	2333(72.71%)	876(27.29%)	3209
diabetes mellitus (Type2)	1132(67.2%)	552(32.8%)	1684
total	3465(71%)	1428(29%)	4893

Case finding rate of HTN and DM in women was likely more than in men. Chi Square=16, df=1, P Value= 0.000

Table-2: The hypertensive and diabetic mellitus patients that have been detected after the family physicians program have been implemented versus the past period.

Sex	1996-2004	2005 - 2011	
Disease			Total
hypertension	1316(41%)	1893(59%)	3209
diabetes mellitus (Type2)	475(28.2%)	1209(71.8%)	1684
total	1791 (36.7%)	3102 (63.3%)	4893

HTN and DM case finding after implementation of family physician program (2005-2011) were more than HTN and DM case finding before that (1996-2004).

T (4891) = -32.051 ,P<0.000

REFERENCES

1) Integrated Management of Cardiovascular Risk,Report of a WHO meeting | Geneva, 9–12 July 2002,1-9. | 2) Screening for Type 2 Diabetes Report of a World Health Organization and International Diabetes Federation meeting. World Health Organization Department of Noncommunicable Disease Management Geneva. 2003,1-4. | 3) Gressani D. Saba J. Fetini H. Rutkowski M. Maeda A. Langenbrunner J;Islamic Republic of Iran Health Sector Review; The World Bank Group Human Development Sector Middle East and North Africa Volume I: Main Report;June 2007.14-24. | 4) Meraci m. Feizi a. Bagher Nejad m. Investigating the Prevalence of High Blood Pressure, Type 2 Diabetes Mellitus and Related Risk Factors According to a Large General Study in Isfahan-Using Multivariate Logistic Regression model.Health system research.2011.1-2. | 5)ghotbi m.Rafati m.Ahmadnia h.Guya mm.Hagh azali m.The principles of diseases prevention and surveillance; The non-communicable diseases surveillance system ;1th.tehran.2008.3-105. | 6) Operational guide for family physician and rural insurance program. Revision number 10. Ministry of Health and Medical Education; Center of health network development and health promotion; Tehran, Iran: 2009 Oct. Number44. | 7) Health sector reform initiatives .Methodology for Monitoring and Evaluation of Health Sector Reform in Latin America and the Caribbean, December 1998,3. | 8) M. van den Donk, A. Sandbaek, K. Borch-Johnsen, T. Lauritzen, et al; Screening for Type 2 diabetes .Lessons from the ADDITION-Europe study: Diabet. Med. 28, 2011.416-1424. | 9) Early screening for diabetes mellitus: has it been overstated?VOL 50: NOVEMBER • NOVEMBRE 2004 d Canadian Family Physician. 1503-4. | 10) D. J. Pereira Gray, P. H. Evans, C. Wright and P. Lang-ley; The cost of diagnosing Type 2 diabetes mellitus by clinical opportunistic screening in general practice: Diabet. Med. 29, 2012.863-868. | 11) Michele Aubin, Lucie Vezina, Jean-Paul Fortin, Paul-Marie Bernard; Effectiveness of a program to improve hypertension screening in primar