Assessment of the participation of primary care services in national tuberculosis control program in Gharbia Governorate

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A B S T R A C T

The aim of this work was to evaluate the Primary Health Care service performance in National Tuberculosis Control Program in Gharbia Governorate.

Methods: The studied area (Gharbia Governorate) includes 8 health territories (each contains 5 primary care units/centers). A questionnaire based on 6 parameters was used to evaluate the PHC system performance:

Methods: I – Physicians basic knowledge about TB (causative agent, methods of spread, clinical picture, essential steps in investigations: X-ray and sputum smear), II – Facilities for primary investigation (sputum examination and chest X-ray), III – Communication with the central health authorities or a TB specialist, IV – Proper recording systems needed for proper patient management and follow up, V – Follow up schedules available for the detected patients, VI – a role in community education about the disease.

The data obtained were tabulated and statistically analyzed.

Results: Studied area included 8 health territories and 40 primary care units (35% were urban and 65% rural) with one physician in each unit. The mean percent of the correct answers of the basic knowledge score was 49.6% (range = 18%–91%), it was higher in urban units physicians than rural units physicians, with lack of proper laboratory (for sputum analysis) or X-ray apparatus. Communication with central health authorities in urban areas was higher than rural areas (71.4% versus 61.5%). Case recording was lower in urban than rural areas (28.6% versus 73.1%). Patient follow up after referral to central health units was higher in rural than urban areas (11.5% versus 7.1%). Participation of community education was 78.6% in urban units and 69.2% in rural units.

Conclusion: In Gharbia Governorate, PHC physicians lack proper knowledge about TB and their units lack proper equipments (Lab and CXR). The PHC system needs to be empowered by the health care authorities through training and equipments for better performance in NTP.

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Introduction

World Health Organization (WHO) Stop TB Strategy explicitly acknowledges that effective and sustainable TB control relies on the general health system, especially on well-functioning Primary Health Care (PHC). Weak health systems pose many barriers to effective TB control [1].

PHC providers should follow the regulations within their country. Good communication with PHC services can be very useful in detecting and treating patients with tuberculosis (TB). Since PHC providers are the patient’s first contact with medical services, the initial suspicion of TB most frequently occurs at the PHC level. When a PHC provider encounters a patient with symptoms indicating TB, he or she should examine the patient, take a medical history, and order sputum smear examination and X-ray (or refer to a provider who can carry out these steps). Referral of a suspected TB case by PHC to specialist can avoid escape of diagnosis of TB case. If TB cases escape suspicion and direction into the right way of medical service spread of the disease and development of bacterial resistance can occur [2].

Aim of the work

Evaluation of the participation of Primary Health Care service in National Tuberculosis Control Program in Gharbia Governorate.
Methods

The studied area (Gharbia Governorate) includes 8 health territories (each contains 5 primary care units/centers). According to the Egyptian NTP (2012) [3], and WHO European region guidelines, (2004) [4], the PHC system should have:

(I) Physicians with basic knowledge about TB (causative agent, methods of spread, clinical picture, essential steps in investigations: X-ray and sputum smear).
(II) Facilities for primary investigation (sputum examination and chest X-ray)
(III) Communication with the central health authorities or a TB specialist.
(IV) Proper recording systems needed for proper patient management and follow up.
(V) Follow up schedules for the detected patients.
(VI) A role in community education about the disease.

This study evaluated the above 6-parameters to check if they have met the required criteria using the following questionnaire system:

1- The basic knowledge is assessed through 11 questions, giving 1 for a positive answer and 0 for a negative or inconclusive one.

These questions are:
(1) What is tuberculosis?
- Infectious disease of the lung caused by tubercle bacilli characterized by lung destruction and fibrosis (1).
(2) What is the causative agent?
- Mycobacterium tubercle bacilli (1).
(3) What are the types of TB? (Pulmonary and extra-pulmonary).
(4) What are the methods of spread? (Droplet, cough and sneezing).
(5) What are the main symptoms? (Cough expectoration, hemoptysis, fever and sweating especially at night)
(6) What are the main signs? (General: weight loss and fever and local: consolidation or fibrosis in upper lobes with or without cavitations).
(7) How to suspect extra-pulmonary TB? (Enlarged cervical LN, chronic skin ulcers, spine deformity or cold abscesses).
(8) What will you do if you suspect a pulmonary TB case? (Sputum for acid fast bacilli, chest X-ray, refer to specialist or central hospital).
(9) What are the main signs in X-ray? (Upper lobe infiltration, fibrosis with or without cavitations).
(10) If sputum smear is negative and X-ray suggestive of TB what will you do? (Refer to the central chest hospital or a specialist).
(11) What are the main drugs used in treatment? (INH, Rifampicin, Pyrazinamide, Ethambutol and Streptomycin).

2- Facilities for case detection and treatment:
(1) Does a working lab for sputum smear exist?
- Yes (1). -No (0).
(2) Does a working X-ray apparatus exist?
- Yes (1). -No (0).
(3) DOTS application?
- Yes (1). -No (0).

3- Communication with central health authorities or a TB specialist:
- Yes (1). -No (0).

4- Proper recording systems for proper patient management and follow up:
-Yes (1). -No (0).

The minimum recorded items required: Name – Age – Sex – Address – Registration Number – Referral site – How suspected (signs and symptoms) – Sputum and CXR results – Diagnosis – treatment given – Follow up and outcome.

5- Follow up patients after referral to central health units:
-Yes (1). -No (0).

How do you make follow up?
- By phone, by visits to the patient or by patient visit to the primary care units.

6- Role in community education:
- Are there any ways to communicate with and educate the public about TB? Yes (1). -No (0).
- Where do you make these communications?
At the primary care units, Youth clubs and collections or during infectious disease prevention campaigns.

Statistical analysis

Collected data were tabulated and analyzed using SPSS version 16 software (Spss Inc, Chicago, IL). Categorical data were presented as numbers and percentages while quantitative data were expressed as mean and standard deviation. Chi square test ($\chi^2$), or Fisher’s exact test, Spearman’s correlation coefficient ($\rho$) and Man Whitney U test were used as tests of significance. The accepted level of significance in this work was stated at 0.05 ($P < 0.05$ was considered significant).

$P$ value $> 0.05$ insignificant.
$P < 0.05$ significant.
$P < 0.001$ highly significant.

Results

The studied area included 8 health territories and 40 primary care units (centers) with one physician in each unit. Urban territories comprised 14 units (35%) and rural territories comprised 26 units (65%). Only 100 patients were recorded in all units (Table 1).

The percent of the correct answers of the basic knowledge score ranged from 18% to 91%, with a mean of 49.6% (Table 2).

Physicians in urban areas had higher scoring in basic knowledge than physicians in rural areas, although the difference was not significant (Table 3).

There was no working lab for sputum analysis or X-ray apparatus in all studied health units/centers but DOTS was applied in all units/centers (Table 4).

The communication with central health authorities in urban areas was higher than rural areas (71.4% versus 61.5%) (Table 5 and Fig. 1).

Table 1: Characteristics of the studied area.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Total N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Care Territories</td>
<td>8</td>
<td>100</td>
</tr>
<tr>
<td>Primary Health Care units/centers</td>
<td>40 (5 for each territory)</td>
<td>100</td>
</tr>
<tr>
<td>Physicians</td>
<td>40 (1 for each units/centers)</td>
<td>100</td>
</tr>
<tr>
<td>Urban</td>
<td>14</td>
<td>35</td>
</tr>
<tr>
<td>Rural</td>
<td>26</td>
<td>65</td>
</tr>
</tbody>
</table>
The availability of recording system (Table 5 and Fig. 1) was lower in urban than rural areas (28.6% versus 73.1%). Patient follow up after referral to central health units was higher in rural than urban areas (11.5% versus 7.1%) although 88.5% of rural and 92.9% of urban patients were not followed up (Table 5 and Fig. 1).

The participation in community education about TB was higher in urban than rural areas (78.6% versus 69.2%) (Table 5 and Fig. 1).

### Discussion

Egypt has succeeded to achieve the global target occupying a place in the target zone. It is classified as one of 36 worldwide countries that have achieved the global targets in both case detection and treatment success in year 2007 [5]. Primary Health Care (PHC) is the first level of contact of individuals, the family and community with the national health system. PHC brings health care as close as possible to where people live and work, and constitutes the first component of a continuing health care process [4].

The studied area includes 8 health territories and 40 primary care units (centers) with one physician in each. Urban territories comprised 14 centers (35%) and rural units comprised 26 units (65%) with only 100 TB patients being recorded in all (Table 1).

In similar studies, In Menoufia governorate the studied area includes 10 health territories and 46 primary care units (centers) with one physician in each unit. Urban territories comprised of 16 units (34.8%) and rural territories comprised 30 units (65.2%). Only 40 patients were recorded in all units [6]. In Qalyubia governorate, the studied area includes 8 health territories and 40 primary care units (centers) with one physician in each with 139 TB patients were recorded in all units [7]. Although there is no golden rule that can be invoked with respect to the rate of doctors available to the population, World Health Organization (WHO) considers that the countries that have less than 23 doctors for every 10,000 people will not be likely able to achieve coverage rates of

### Table 3
Basic knowledge of the studied physicians according to area: urban versus rural.

<table>
<thead>
<tr>
<th>Knowledge score area</th>
<th>Rural (N = 26)</th>
<th>Urban (N = 14)</th>
<th>Total (N = 40)</th>
<th>X2/Fisher’s P</th>
</tr>
</thead>
<tbody>
<tr>
<td>M ± SD</td>
<td>47.73 ± 19.14</td>
<td>52.92 ± 19.23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>“Z” of MWU</td>
<td>1.45</td>
<td>0.74</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>0.14</td>
<td>0.00</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table 4
Facilities for case detection in the studied health units/centers.

<table>
<thead>
<tr>
<th>Variable</th>
<th>N %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working lab for sputum smear</td>
<td>0.00</td>
</tr>
<tr>
<td>Working X-ray apparatus</td>
<td>0.00</td>
</tr>
<tr>
<td>Availability of DOTS</td>
<td>100.0</td>
</tr>
</tbody>
</table>

The availability of recording system (Table 5 and Fig. 1) was lower in urban than rural areas (28.6% versus 73.1%). Patient follow up after referral to central health units was higher in rural than urban areas (11.5% versus 7.1%) although 88.5% of rural and 92.9% of urban patients were not followed up (Table 5 and Fig. 1).
adequate Primary Health Care services. In Egypt the rate is 24 doctors for every 10,000 people versus 32 doctors for every 10,000 people in Europe [8].

In our study, basic knowledge (Tables 2–3) of the studied physicians about TB (the percent of the correct answers of TB questionnaires), ranged from 18% to 91%, with a mean of 49.6% which is too variable while qualification and training of PHC physicians should be similar regardless of the place. In Menoufia governorate the basic knowledge of the studied physicians about TB (% of the correct answers of TB questionnaires), ranged from 18% to 81%, with a mean of 54.5% [6]. In Qalyubia governorate the basic knowledge of the studied physicians about % of the correct answers of TB questionnaires ranged from 18% to 100%, with a mean of 48.2% [7]. PHC physicians must have continuous medical education about TB and its management. They must know the causative agents, types, standard methods for diagnosis and broad lines of TB management [9]. The wide variation of TB basic knowledge score seen in our results means that some areas will have a drop in TB control and this will be reflected on the whole community as TB is an infectious disease.

In the present study, the basic knowledge of the studied physicians according to area: urban versus rural, revealed that physicians in urban areas have higher scoring in their basic knowledge than physicians in rural areas, although the difference was not significant. Being in one country, PHC physicians whether in rural or in urban areas must have a standard qualification. In this work, the availability of facilities for case detection in the studied health units/centers but DOTS was applied in all units/centers (Table 4). In Menoufia governorate, the facilities for case detection in the studied health units/centers revealed that there was no working lab for sputum analysis or X-ray apparatus in all studied health units/centers but DOTS was applied in all units/centers (Table 4). In Menoufia governorate, the facilities for case detection in the studied health units/centers revealed that there was no working lab for sputum analysis or X-ray apparatuses in all studied health units/centers but DOTS was present in 32 units (69.6%) and there were 7 working X-ray apparatuses (15.2%) in all studied health units/centers [6].

In Qalyubia governorates there was no working lab for sputum analysis or X-ray apparatuses in all studied health units/centers but there was only availability of DOTS in all [7]. Availability of diagnostic tools for new cases of TB especially X-ray and sputum smear examination [10]. Being the first person faced with a TB case, PHC physician is able to diagnose cases early by doing smear staining for acid fast bacilli.

Lack of such simple diagnostic tools in primary care will delay diagnosis, helping spread and development of resistance in TB cases which imparts a great cost and hazard in managing such cases with delayed diagnosis [11]. The absence of such simple diagnostic tools and personnel trained on their use in Gharbia Governorate reflects another big defect in disease control.

In the present study, communication with central health authorities (Table 5 Fig. 1) in urban areas was higher than rural areas (71.4% versus 61.5%), this is due to the fact that central health authorities are located in the urban areas.

In Menoufia governorate, communication with central health authorities or TB specialists was present in (89.1%) and absent in (10.9%) and was nearly equal in urban and rural areas (87.5% vs. 86.7%) [6].

In Qalyubia governorates poor communication was found with central health authorities or TB specialists which ranged from 8% to 16% [7].

PHC physicians must communicate both with the patient and health authorities. Communication with patient to emphasize that TB is a curable condition and to stress the importance of regular follow up during treatment and with specialized health authorities to be aware of patients who were referred for diagnosis and treatment [12]. Absence of communication with central health authorities in large numbers of PHC units in Gharbia Governorate constitutes a big defect in TB control in the governorate and reflects the absence of follow up of central health authorities and needs strict and rapid interventions. In this work, case recording (Table 5 Fig. 1) was lower in urban than rural areas (28.6% versus 73.1%). The availability of a proper recording system was found in only 23 units (57.5%) with marked variation between units in the same territory. This may be explained by the fact that the recording system is mainly done by nurses who are not followed up by the territory authority and another factor could be the absence of financial incentive to nurses for their extra duty. In Menoufia governorate, case recording was higher in rural areas (43.3%) than urban areas (6.25%) [6].

In Qalyubia governorate, case recording was higher in rural 46.2% than in urban areas 42.9% [7]. Case recording is an essential part of TB control program both internationally and locally. Case recording with essential data about resistance and methods of communication with patients as well as type of the disease, pulmonary or extrapulmonary, sensitive or resistant and if the later mono or multi drug resistant. Data of the patients help close follow up and avoid losing them for a long time so that proper intervention is to be taken [3]. Again lack of recording systems for diagnosed TB cases constitutes a big fault in TB control in Gharbia Governorate as well as lack of follow up from central health authorities.

TB control programs should maintain a computerized record system (case registry) with up-to-date information on all current clinically active and suspected TB cases in the community. To ensure follow up of all TB patients and those persons suspected of having TB, registry information (e.g., smear, culture, and susceptibility results; clinical status; chest radiograph results; and doses of medications being administered) should be obtained and updated on a continuing basis [13].

In this work patient follow up after referral to central health units (Table 5 Fig. 1) was found in 4 units (10%). This is almost due to lack of awareness about the importance of follow up of the cases and constitutes a big gap in which good TB control sinks and fails because one of the important roles of PHC in NTP according to WHO treatment guidelines [1] is patient follow up. In Menoufia governorate, Patient follow up after referral to central health units was found to be higher in urban than rural areas (23.3% vs. 62.5%) although 76.7% of rural and 93.75% of urban were not followed up [6]. was found to be higher in urban than rural areas (11.5% vs 7.1%), although 88.5% of rural and 92.9% of urban were not followed up [7]. Lack of patient follow up is one of the important factors that lead to default treatment in TB because patients misunderstand stopping follow up as an indication of cure or failure to cure, both of which force patients to stop their treatment. Follow up of patients give them a direct clue of the importance of their treatment and includes continuous encouragement to complete and to change medication as required when side effects develop while in contact with central health authorities. This follow up is stressed in all TB control programs given by WHO or national authorities [10]. In this study, (Table 5 Fig. 1) the participation of both rural and urban units in community education about TB was nearly equal (69.2 versus 78.6%). The participation in community education about TB was practiced in 29 units (72.5%). In Menoufia governorate, comparison among the studied territories regarding participation in community education revealed that only 28 from 46 units in the studied 10 territories (60.9%) have community education with marked variation between territories [6].

In Qalyubia governorate, there were only 31 of 40 units in the studied 8 territories (77.5%) have community education with marked variation between territories [7]. TB, like other infectious diseases, can be controlled when awareness about transmission in the community is high. Increased awareness about TB and
contribution of the community in TB control are essential [14]. Contacts of the patient are more susceptible to infection [15] so, education of patient family for proper home ventilation, avoidance of direct exposure to patients’ air droplets on coughing and disinfection methods is essential [16].

Conclusions

In Gharbia Governorate, PHC physicians lack proper knowledge about TB and their units lack proper equipments (Lab and CXR). There was a low communication between PHC providers and the central health authorities, with lack of proper recording and follow up of cases. The PHC system needs to be empowered by the health care authorities through training and equipments for better performance in NTP. More wide research is needed to cover PHC system performance in NTP all over Egypt.

References