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The Impact of Active Case Finding among Household Contacts of Sputum Smear Positive Patients on the Case Detection Rate.

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Abstract:

Background: Tuberculosis is one of the major public health problems which is targeted by global control. One of the main strategies for control of tuberculosis is to achieve a case detection rate of 70% or more of sputum smear positive cases of the estimated annual new infections.

Objectives: This study was conducted to assess the impact of active case finding among sputum smear positive household contacts in great Wad Madani locality Gezira State, Central Sudan.

Methods: The study was a prospective longitudinal study in which all household contacts of sputum smear positive cases who were diagnosed during the study period and who accept to participate in the study were home visited and screened using adapted World Health Organization (WHO) screening forms for the main symptoms and signs of tuberculosis.

Those who were found to be symptomatic were further investigated by sputum examination (three specimens), for adults. chest X ray and Mantoux test for unvaccinated under five children.

Results and conclusions: A total of 161 cases were detected passively during the study period, 153 agreed to participate in the study. A total of 659 household contacts were screened. Of those 24 were found to be sputum smear positive giving a prevalence of 3.6% among household contacts and the case detection rate increased from 35.4/ 100.000 through passive case finding, to 40.8/100.000 through active case finding giving that active case finding can increase the case detection rate which is one of the main goals of tuberculosis control strategies.

ملخص:

خلفية :السل احد مشاكل صحة المجتمع الهامة و مستهدف بتحكم عالمي . أحدى الاستراتيجيات الهامة للتحكم في السل هو إنجاز معدل رصد الحالة 70% أو اكثر من مسحة القشع الإيجابية لحالات العدوى (الأخماج) الجديدة المتوقعة سنوياً.

الأهداف : أجريت الدراسة لتقييم أثر رصد الحالات النشطة وسط المخالطين المنزليين (الأسريين) بقشع إيجابي المسحة في محلية ود مدني الكبرى – السودان.

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الطرق : هذه دراسة توقعية طولانية شملت كل المخالطين المنزليين لحالات القشع موجب المسحة الذين تم تشخيصهم خلال فترة الدراسة و قبلوا بالمشاركة في البحث أجريت لهم زيارات منزلية و أجري المسح باستخدام فورمات منظمة الصحة العالمية لمسح الاعراض و العلامات لمرض السل.

النتائج والخلاصه : تم رصد 161 حالة سلبياً خلال فترة الدراسة منهم 153 قبلوا بالمشاركة في الدراسة، تم مسح 659 من المخالطين المنزليين. القشع موجب المسحة وجد في 24 حالة مما أعطى معدل شيوع 3.6% وسط المخالطين المنزليين و ارتفاع معدل رصد الحالة من 35.4/100.000 فى الاكتشاف السلبى إلى 40.8/100.000 في الاكتشاف النشط مما يعني أن الاكتشاف النشط يمكن أن يزيد معدل الرصد وهو من أهم أهداف و إستراتيجيات التحكم في مرض السل.

Background

Although a lot of efforts were done during the last century to control Tuberculosis (TB) still it is one of the major global public health problems, with increasing burden world wide. An analysis of the global tuberculosis case notification rate estimated that only 27% of the new smear positive cases are detected by the current existing systems[1]. This low case detection rate remain an obstacle to the long-term success of TB control programs world wide. Till few years ago WHO policy emphasizes passive case finding in contrast with the identification of cases through screening. This strategy has been based on the expectation that passive detection of individuals ill enough to seek medical care is far more cost effective than population-based screening and compliance to treatment will be higher in those who have identified themselves as symptomatic[2]. Nonetheless, the failure of national TB programs to detect the vast majority of new infectious cases suggests that active screening strategies should be reevaluated in an attempt to improve case detection and thereby, increase access to TB treatment and control.

Recently WHO adopted the following goal (to reduce mortality, morbidity and disease transmission while preventing drug resistance till TB no longer poses a threat to public health [1]. The aim is also to reduce human suffering and the social and economic burden on families and communities as a consequence of TB. In order to achieve this it is necessary to ensure access to diagnosis, treatment, and cure for each patient through achieving the following targets. 70% case detection rate of existing cases of sputum smear positive cases and 85% cure rate for diagnosed cases.

In Sudan .Directly Observed Therapy Short Course. (DOTS) was introduced in the year 1995 in some model areas. (DOTS) all over was declared in the year 2002 as a strategy to decrease the burden of the disease by increasing the case detection rate and the cure rate. Although this strategy has a significant improvement in the cure rate which increased up to 81% in the year 2006 and is approaching the global target of 85%. But unfortunately it has little effect in the case detection rate which is still only 30% compared to the global target of 70% or more.[4]

There are many factors behind this low case detection rate mainly ignorance ,poverty ,inaccessible health services and the high level of social stigma associated with the disease.

Objectives:

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General objective: To assess the impact of active case finding among household contacts of sputum smear positive patients on the case detection rate.

Specific objectives:

1- To screen household contacts of passively diagnosed sputum smear positive cases.
2- To identify suspected cases among household contacts and confirm them by more investigations (sputum examination .CX- ray or Mantoux test).
3- To provide treatment to confirmed cases using the national treatment protocol.
4- To provide preventive treatment for high risk household contacts.

Secondary objectives:

1- To build the capacity of health workers working in tuberculosis control program who participated in this study .
2- To raise the awareness and minimize the stigma among household contacts through health education during the home visits.

Materials and methods:

Study area: Sudan is one of the African developing countries with a total population of 38 million and an area of 2.5 million Km2.[4] Sudan is shouldering about 8-10% of the disease burden in the Eastern Mediterranean Region(EMRO)[3] with an estimated incidence of 79/ 100000 new cases annually that is a total of 30,028/ year. The case detection rate is only 30%**.**[4]

Gezira state is one of the central states of Sudan with an area of 35.000 square kilometer and a total population of 4 million [1]. It is the second populous state after Khartoum state the capital of the country; approximately more than 1/10th of the country population reside in this state.

The state is divided into seven localities. One of them is selected as the study locality (Great Wad Medani locality with a total population of 453613, 16 TB diagnostic centers & 34 DOTS centers .

Study subjects: All household contacts of sputum smear positive cases diagnosed in Great Wad Medani locality during the study period who agreed to participate in the study by verbal or written consent, were recruited, for children consent was obtained from their gardens.

Inclusion criteria: Household contacts of sputum smear positive cases

Exclusion criteria: Household contacts of sputum smear negative or extra pulmonary tuberculosis cases.

Study design: This was a prospective longitudinal study, conducted during the period September 2009 – August 2010 .All sputum smear positive tuberculosis cases who were diagnosed during this period and who agreed to participate in the study were recruited . Home visits were conducted by pre agreed upon dates. The home visits were conducted by two public health doctors and a medical assistant working in the state TB control program. The household contacts were screened for the main symptoms and signs of tuberculosis (fever, cough ,loss of weight, and blood in the sputum). Any of the household contacts who was found to be symptomatic was classified as a suspected case and referred to the main diagnostic center

and further investigated for tuberculosis by up to three sputum examinations chest X ray and complete blood picture.

Those who were found to be positive by sputum examination or chest X-ray were treated according to the national treatment protocol.

Those who were found to be from the high risk groups (under five children and elderly) were given prophylactic treatment with INH.

Results:

A total of 161 cases were identified passively during the study period. Of those 153 (95%) accepted to participate in the study while 7 (5%) refused mainly because they don't like to declare their disease status to their family members.

During the 153 home visits 659 household contacts were screened 46 of them (6.9%) were under five years old. 46.1 % of them were males and 53.6 were females .28.6% of them were illiterate and 31.2% of them have less than 7 years of education.

Table (1): shows presence and distribution of symptoms among symptomatic contacts (n176)

Symptoms	**NO. of cases**	***Percentages***
Fever	123	18.6%
Cough	117	17.2%
Loss of weight	64	9.7%
Blood in sputum	28	4.2%
All of the above symptoms	18	2.7%

The total number of contacts who were found to be symptomatic was 176. some of them have more than one symptom

Table (2): shows sputum positivity with repeated testing (n130)

Sputum	**Number**	**Percentage**
First specimen	19	14.6
Second specimen	3	2.3

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Third specimen	2	1.5
Total	24	18.4

Sputum examination was done for all adults and children above five years, a total number of130 subjects. 24 (18.4%) were found to be sputum positive.

Chest X-ray examination was done to 56 of household contacts 12 (20.1%) of them shows signs of tuberculosis infection.

Twenty nine (29) of the symptomatic under five children were found to be vaccinated giving a vaccination rate of 63.1%.Those who were found to be not vaccinated were further screened by Mantoux testing 17, of those 9 (52.8%) were found to be positive .all of them were seen by a pediatrician 5 of them were diagnosed as tuberculous and treated and the remaining 4 were given INH as prophylactic treatment.

Table (2): the case detection rate

Detection	**Detected**	**Not detected**
Passive detection	161	274
Passive + active detection	185	255

Chi=6.39 p 0.011

The estimated national annual infection rate is 97/100,00, thus the expected number of new cases in Great Wad Medani locality is 440.the passive case detection rate was161/440= 37.4% and the active case detection rate was 185/440= 43 %.

Discussion :

During the study period a total of 161 sputum smear positive cases were identified through passive case finding giving a case detection rate of 35.4/100.000 The case detection rate was increased to 185 by the active case finding giving a case detection rate of 40.7/100.000 (chi square 6.399 and p value of 0.0114) meaning that these findings are statistically significant

Comparing the results of this study with results of a study conducted in Ethiopia through a village outreach program during the period 2003 – 2004 the case detection rate increased in the study group to 48.7% compared to 46.8% in the control group[7] although the results in this study were not statistically significant it was mentioned that this study was done through out reach program and not direct home visits.

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These results are comparable with results of a study conducted in Peru through direct home visits to household contacts and neighbourhood contacts. The case detection rate was 314/100.000 through combined passive and active case finding compred to 181/100.000 through passive case finding alone[8].

The prevalence of smear positive tuberculosis among household contacts in this study was 3.6% (24/659%) This result is consistent with results of a study conducted in the Islamic Republic of lran which showed a familly history of 2.7% among index cases close contacts [9] and a prevalence of 8.5% among familly members in study conducted in Pakistan.[10]

One of the interesting findings in this study is that during the home visits of index cases who were visited five of them were found to be secondary cases to an already diagnosed case. This provide an evidence that the organism is circulating among the household contacts who still have low care seeking behavior

All these findings strongly indicate that familly members of infected patients need to be home visited and screened to increase the case detection rate, to cut the chain of transmission and to reduce morbidity of tuberculosis.

Conclusion:

Active case finding of sputum smear positive cases of tuberculosis can be increased through active case finding by screening of household and close contacts of patients.

Recommendation:

1. Active case finding is to be streamlined within the national country tuberculosis control programme activities.
2. Regular home visits are to be conducted to all sputum smear positive cases to deliver health education massages and to provide psychological and social support to both the patients and their families.

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