Newly Registered Tuberculosis: A Comparison of Rate and Success of Management in Two Island Districts with Different in Accessibility of Transportation in Thailand

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Abstract

Background: Tuberculosis is an important infection that can be seen in several countries. The occurrence of disease in the remoted setting is an interesting issue that is an actual challenge for management. Here, the authors present and discuss on the newly registered tuberculosis cases in two island districts of Thailand, a tropical endemic country in Southeast Asia. Methods: The authors hereby retrospectively analyzed registered data of newly registered tuberculosis cases in two island districts with different in accessibility of transportation in Thailand. A comparison of rate and success of management was made. Results: According to the statistical analysis, there is a significant difference of incidence rates of newly registered tuberculosis cases between the two island districts (0.13% vs. 0.04%). There is also a significant difference of successful antituberculosis drug management rates between the two island districts (72.7% vs. 100%). Conclusion: The island district with easier accessibility by transportation has a more number of newly registered tuberculosis case and a less success rate of antituberculosis drug treatment.

Keywords: Accessibility, island, rate, success, transportation, tuberculosis

INTRODUCTION

There are many communicable diseases that are still present public health problem globally. Tuberculosis is an important mycobacterial infection that is still endemic in several areas of the world. The disease is considered as an important communicable disease.[1] Despite there are many public health manipulations to control this disease, it is still not successfully for eradicating this ancient well-known infectious disease. The infection can result in chronic lung disease, and the infection might be latent.[2] Spreading of disease from a latent tuberculosis patient to the others in the community is a big problem. Therefore, the present public health concept is to have an active case search and strict monitory of antituberculosis drug treatment. The detection of new cases and monitoring of success of antituberculosis drug treatment are basic requirements in tuberculosis control. Nevertheless, there is still a problem in case detection and it is still an important problem for tuberculosis control in endemic country.[3] The success of control activities is usually not derived in the setting where there is a high disease burden. Several factors including geographical limitation might affect tuberculosis control management.[4]

In the present report, the authors focus a specific interest on the island community, which is limited reported on tuberculosis management. Here, the authors summarize and reappraise on the data of newly registered tuberculosis cases in two island districts of Thailand, a tropical endemic country in Southeast Asia.

METHODS

This is a retrospective analysis on public available local registered data on tuberculosis control activity. The study...
settings are two nearby island districts in Thailand, a tropical country in Indochina where tuberculosis is endemic. The two island districts namely “Koh Chang district” and “Koh Kood” district” which lie near Thailand – Cambodia border [Figure 1]. “Koh Chang district” is a blooming area as beach resort for tourists. Now, the accessibility is very easy. There are several boat ferry lines running between island and mainland, more than 30 times/day. The travel time between island and mainland is about 20 min. “Koh Kood” district” has difficulty in accessibility. The only one access path is through boat ferry that takes more than 4 h, and there are limited numbers of ferry communication to the land, <3 times/day and it does not operate daily.

In the study, the authors focus the interest on the specific data on newly registered tuberculosis in the two studied island districts. The update data on year 2018 (bie.moph.go.th/e-insreport/file_report/2018-08-06-01-53-10-11.pdf) are analyzed. Specific data on the rate of newly registered tuberculosis cases and success of antituberculosis drug management of those cases are collected and reappraised. The rate is calculated and the comparison of rate is further performed using proportion Z-test.

As a retrospective study on primary public available registered data, there is no requirement for obtaining written informed consent. The protocol of this work has been approved by Local Scientific Committee (No. KMT 2019-28, Date March 5, 2019).

RESULTS

The incidence rates of newly registered tuberculosis cases in “Koh Chang district” and “Koh Kood” district” are equal to 0.13% (130/100,000 local population) and 0.04% (40/100,000 local population), respectively [Table 1]. According to the statistical analysis, there is a significant difference of incidence rates of newly registered tuberculosis cases between the two island districts ($P < 0.05$). The rates of successful antituberculosis drug management in “Koh Chang district” and “Koh Kood” district” are equal 72.7%–100%, respectively. According to the statistical analysis, there is also a significant difference of successful antituberculosis drug management rates between the two island districts ($P < 0.05$).

DISCUSSION

Island is a specific geographical setting with a background nature of isolation from other parts of the world. The accessibility of many islands is usually limited. The difficulty in accessibility might affect the pattern of disease and management in the island community. In fact, as an isolated community, if there is a pure complete isolate, there will be no chance of newly imported disease and the disease control might not difficult.

In the present report, the authors perform situation analysis on two island districts in Thailand. This is a good case study on the interrelationship between background geography and the outcome of tuberculosis control. In the island with a limitation on access, the situation of tuberculosis is less serious with less incidence and higher success rate of antituberculosis management. Indeed, exploring the geographic pattern of tuberculosis using geographic information system (GIS) is confirmed as a useful public health approach for planning for disease control. Significant geographical heterogeneity is usually observed, and the identified interrelationship with local tuberculosis epidemiology can be used for further disease control. The GIS can also be applicable to assess the relationship to locally specific environmental insult that can trigger tuberculosis and further affect local tuberculosis epidemiology.

In fact, the effect of geographical limitation on the local tuberculosis control can be demonstrated in case of tuberculosis control at the border area. For example, the disease control at Thailand-Myanmar international border area is usually difficult and there is a very high failure rate. This is due to difficulty

| Island districts     | “Koh Chang district” | “Koh Kood district” |
|----------------------|----------------------|---------------------|
| Number of local population in the district | 8476 | 2514 |
| Number of newly registered tuberculosis | 11 | 1 |
| Number of success tuberculosis drug treatment | 8 | 1 |

*Number of local population in the district in the year 2018 is referred to the official data by Thai Ministry of interior
in control of disease among cross border migrant and the transportation limitation to the remote villages lie along the international border.[9] Nevertheless, the present report shows different geographical backgrounds. The isolation due to nature of island act as natural barrier and it can help blocking the disease influx and transfer out.[10] According to the previous report, island size and human factors such as the intensity of commercial networks are factors affecting tuberculosis epidemiology in islands.[11]

Regarding the tuberculosis treatment, an important problem is drug resistance. In a recent report from South India, the ofloxacin-resistant multidrug-resistant tuberculosis is detectable in newly registered cases.[11] In our setting, Indochina, a similar high incidence of multidrug-resistant tuberculosis can be observed in some remote areas.[7,8] Nevertheless, there was no multidrug-resistant tuberculosis case in the studied setting.

**Conclusion**

There is a difference in the rate and success of the management of tuberculosis in the two different island districts. The island district with more limited accessibility has a less number of newly registered tuberculosis cases and a more success rate of antituberculosis medication management. In case that there is a good transportation system linking between the island and outer land, there will be a chance of importation of disease and increased difficulty of disease control can be expected.

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**Conflicts of interest**

There are no conflicts of interest.

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