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Original Article

Review of Active Tuberculosis Screening Program Combined with Health Care Service Plan in Mountainous Townships in North Taiwan, 2017

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Xiang-Ting Huang, Shu-Li Chiang

Abstract

People who live in mountainous townships are high-risk groups for tuberculosis infection. Taiwan Centers for Disease Control (TCDC) has been carrying on chest X-ray screening program in mountainous townships. Since 2017, TCDC mandated the local hospitals in the Integrated Health Care Delivery System (IDS) to carry out the chest X-ray program to promote the accessibility. The mandated program is aimed to integrate medical resources and avoid wasting, which helps the local public health departments to provide tuberculosis disease screening, diagnostics and treatments directly.

During the executive period in 2017, the local public health department found that the abnormal findings of the chest X-ray screening were remarkably lower than those in 2016 and decided to launch recheck mechanism and used the Kappa statistics to test inter rater reliability. The calculated result of Kappa was 0.7, indicating fair agreement. However, 5 tuberculosis cases were determined by recheck mechanism and 1 was determined by alert of public health workers. It revealed the public health sectors should regularly evaluate the service provided by the mandated IDS hospitals and the quality of X-ray interpretation. The quality of chest X-ray interpretation is the key factor of the effectiveness of active screening. Therefore, we suggested building a mechanism for

evaluation and review for the mandated hospitals to ensure the quality of X-ray interpretation. Meanwhile, the public health sectors should promptly follow cases with abnormal results and actively conduct screening among high risk populations to obtain the best screening effectiveness.

Keywords: Mountainous township, tuberculosis, chest X-ray screening, double check mechanism

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Investigation And Intervention of Multiple Drug-Resistant Tuberculosis Outbreak in A Community of Yunlin County, 2017

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Abstract

A patient of multidrug-resistant tuberculosis (MDR-TB) was first identified in a community, which had relatively high TB incidence rates and large number of drug-resistant TB cases, in Yunlin County in 2005. Afterwards, a total of 14 MDR-TB cases with the same strain had been reported before 2017. To prevent the TB outbreak from wide spreading in the community, the health authorities established prevention measures by re-investigation of the outbreak after a specialist meeting on Oct. 17, 2017. Epidemiologic investigation revealed that at least three interpersonal networks might be the transmission chains of the outbreak. After screening in the community, 164 interferon gamma release assay (IGRA)-positive patients were detected and were futher divided into 148 MDR-TB contacts and 16 TB contacts. Among 16 TB contacts, 13 completed latent tuberculosis infection treatment, 2 were receiving 9H treatment, and 1 discontinued the treatment. Up to 2018, no new case had been found, which indicated that the intervention by active case finding and early treatment was effective to prevention and control the outbreak.

Keywords: Community epidemic, tuberculosis outbreak, MDR-TB, epidemiologic investigation, questionnaire

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Weekly Data of Notifiable Infectious Diseases (by week of diagnosis)

Case diagnosis year		Week 10★		Week 1-10			
				2020		2019	
Classification	Disease Diagnosed	2020	2019	Total cases★	Imported cases	Total cases★	Imported cases
Category I	Plague	0	0	0	0	0	0
	Rabies	0	0	0	0	0	0
	SARS	0	0	0	0	0	0
	Smallpox	0	0	0	0	0	0
Category II	Acute Flaccid Paralysis	0	1	4	0	11	0
	Acute Viral Hepatitis type A	3	2	22	4	14	3
	Amoebiasis	6	7	47	17	58	27
	Anthrax	0	0	0	0	0	0
	Chikungunya Fever	0	0	1	1	0	0
	Cholera	0	0	0	0	0	0
	Dengue Fever	4	9	45	45	89	88
	Diphtheria	0	0	0	0	0	0
	Enterohemorrhagic E. coli Infection	0	0	0	0	0	0
	Epidemic Typhus Fever	0	0	0	0	0	0
	Hantavirus Pulmonary Syndrome	0	0	0	0	0	0
	Hemorrhagic Fever with Renal Syndrome	1	0	3	0	0	0
	Malaria	0	0	1	1	1	1
	Measles	0	5	2	2	30	14
	Meningococcal Meningitis	0	0	3	0	2	0
	Paratyphoid Fever	0	0	0	0	0	0
	Poliomyelitis	0	0	0	0	0	0
	Rubella	0	1	0	0	2	2
	Shigellosis	3	1	36	5	21	7
	Typhoid fever	1	0	4	2	4	4
	West Nile Fever	0	0	0	0	0	0
	Zika virus infection	0	0	1	1	1	1
Category III	Acute Viral Hepatitis type B	2	3	21	2	24	0
	Acute Viral Hepatitis type C	17	10	136	1	102	0
	Acute Viral Hepatitis type D	0	0	0	0	0	0
	Acute Viral Hepatitis type E	0	0	4	0	5	1
	Congenital Syphilis	0	0	0	0	0	0
	Congenital Rubella Syndrome	0	0	0	0	0	0
	Enteroviruses Infection with Severe Complications	1	1	7	0	4	1
	Haemophilus Influenza type b Infection	0	0	0	0	0	0
	Japanese Encephalitis	0	0	0	0	0	0
	Legionnaires' Disease	2	1	55	2	44	3
	Mumps	8	14	90	1	105	0
	Neonatal Tetanus	0	0	0	0	0	0
	Pertussis	3	2	8	0	7	0
	Tetanus	0	0	0	0	0	0
Category IV	Botulism	0	0	0	0	0	0
	Brucellosis	0	0	0	0	0	0
	Complicated Varicella	0	1	12	0	16	1
	Endemic Typhus Fever	0	0	0	0	1	0
	Herpesvirus B Infection	0	0	0	0	0	0
	Influenza Case with Severe Complications	0	56	545	6	553	2
	Invasive Pneumococcal Disease	3	10	109	0	123	1
	Leptospirosis	0	1	7	0	12	0
	Listeriosis	1	10	21	0	37	0
	Lyme Disease	0	0	0	0	0	0
	Melioidosis	0	0	2	1	0	0
	Q Fever	0	0	0	0	1	0
	Scrub Typhus	3	3	45	1	67	0
	Toxoplasmosis	0	1	0	0	3	0
	Tularemia	0	0	0	0	0	0
Category V	Ebola Virus Disease	0	0	0	0	0	0
	Lassa Fever	0	0	0	0	0	0
	Marburg Hemorrhagic Fever	0	0	0	0	0	0
	Middle East Respiratory Syndrome Coronavirus Infections	0	0	0	0	0	0
	Novel Influenza A Virus Infections	0	0	0	0	0	0
	Rift Valley Fever	0	0	0	0	0	0
	Severe Pneumonia with Novel Pathogens	6	0	45	20	0	0
	Yellow Fever	0	0	0	0	0	0

1. ★The weekly and cumulative total numbers include indigenous and imported cases of notifiable infectious diseases.
2. MDR-TB, Tuberculosis, Syphilis, Gonorrhea, HIV Infection, AIDS, Hansen's Disease and Creutzfeldt-Jakob Disease are excluded from the table.
3. Numbers of mumps and tetanus cases are summed up by the week of report.
4. Since 2020/1/15, "Severe Pneumonia with Novel Pathogens" was listed as a Notifiable Infectious Disease.

Suspected Clusters

●Fourteen clusters were reported during week 10, including 3 tuberculosis clusters, 8 diarrhea clusters, 2 upper respiratory tract infection clusters, 1 varicella cluster.

Imported Infectious Diseases

●There were 9 imported cases from 5 countries / areas during week 10 of 2020.

Countries / Areas / Diseases	Indonesia	Singapore	Bangladesh	Philippines	Diamond Princess	Total
Dengue Fever	3	1				4
Severe Pneumonia with Novel Pathogens				1	1	2
Acute Hepatitis A	1					1
Amoebiasis	1					1
Typhoid fever			1			1
Total	5	1	1	1	1	9

●There are 111 imported cases from 19 different countries in 2020. The top 3 countries are Indonesia (32), China (18), the Philippines (15).

●Top 3 imported diseases are Dengue Fever (45), Severe Pneumonia with Novel Pathogens (20), Amoebiasis (17).

Summary of Epidemic

●**Severe Pneumonia with Novel Pathogens**：The risk of local infection and imported are gradually increasing.

Weekly Data of Notifiable Infectious Diseases (by week of diagnosis)

Case diagnosis year		Week 11★		Week 1-11			
				2020		2019	
Classification	Disease Diagnosed	2020	2019	Total cases★	Imported cases	Total cases★	Imported cases
Category I	Plague	0	0	0	0	0	0
	Rabies	0	0	0	0	0	0
	SARS	0	0	0	0	0	0
	Smallpox	0	0	0	0	0	0
Category II	Acute Flaccid Paralysis	0	1	4	0	12	0
	Acute Viral Hepatitis type A	2	4	24	4	18	6
	Amoebiasis	9	5	56	22	63	30
	Anthrax	0	0	0	0	0	0
	Chikungunya Fever	1	0	2	2	0	0
	Cholera	0	0	0	0	0	0
	Dengue Fever	3	5	48	48	94	93
	Diphtheria	0	0	0	0	0	0
	Enterohemorrhagic E. coli Infection	0	0	0	0	0	0
	Epidemic Typhus Fever	0	0	0	0	0	0
	Hantavirus Pulmonary Syndrome	0	0	0	0	0	0
	Hemorrhagic Fever with Renal Syndrome	0	0	3	0	0	0
	Malaria	0	0	1	1	1	1
	Measles	0	3	2	2	33	14
	Meningococcal Meningitis	0	0	3	0	2	0
	Paratyphoid Fever	0	0	0	0	0	0
	Poliomyelitis	0	0	0	0	0	0
	Rubella	0	1	0	0	3	2
	Shigellosis	6	3	42	17	24	8
	Typhoid fever	1	0	5	3	4	4
	West Nile Fever	0	0	0	0	0	0
	Zika virus infection	1	0	2	2	1	1
Category III	Acute Viral Hepatitis type B	1	1	22	2	25	0
	Acute Viral Hepatitis type C	17	14	153	1	116	0
	Acute Viral Hepatitis type D	0	0	0	0	0	0
	Acute Viral Hepatitis type E	0	0	4	0	5	1
	Congenital Syphilis	0	0	0	0	0	0
	Congenital Rubella Syndrome	0	0	0	0	0	0
	Enteroviruses Infection with Severe Complications	0	0	7	0	4	1
	Haemophilus Influenza type b Infection	1	0	1	0	0	0
	Japanese Encephalitis	0	0	0	0	0	0
	Legionnaires' Disease	3	9	58	2	53	4
	Mumps	9	16	99	2	121	0
	Neonatal Tetanus	0	0	0	0	0	0
	Pertussis	0	2	8	0	9	0
	Tetanus	0	0	0	0	0	0
Category IV	Botulism	0	0	0	0	0	0
	Brucellosis	0	0	0	0	0	0
	Complicated Varicella	1	2	13	0	18	1
	Endemic Typhus Fever	1	0	1	0	1	0
	Herpesvirus B Infection	0	0	0	0	0	0
	Influenza Case with Severe Complications	0	37	545	6	590	2
	Invasive Pneumococcal Disease	3	8	112	0	131	1
	Leptospirosis	1	0	8	0	12	0
	Listeriosis	3	0	24	0	37	0
	Lyme Disease	0	1	0	0	1	1
	Melioidosis	1	0	3	1	0	0
	Q Fever	1	0	1	0	1	0
	Scrub Typhus	4	2	49	1	69	0
	Toxoplasmosis	0	0	0	0	3	0
	Tularemia	0	0	0	0	0	0
Category V	Ebola Virus Disease	0	0	0	0	0	0
	Lassa Fever	0	0	0	0	0	0
	Marburg Hemorrhagic Fever	0	0	0	0	0	0
	Middle East Respiratory Syndrome Coronavirus Infections	0	0	0	0	0	0
	Novel Influenza A Virus Infections	0	0	0	0	0	0
	Rift Valley Fever	0	0	0	0	0	0
	Severe Pneumonia with Novel Pathogens	8	-	53	26	-	-
	Yellow Fever	0	0	0	0	0	0

1. ★The weekly and cumulative total numbers include indigenous and imported cases of notifiable infectious diseases.
2. MDR-TB, Tuberculosis, Syphilis, Gonorrhea, HIV Infection, AIDS, Hansen's Disease and Creutzfeldt-Jakob Disease are excluded from the table.
3. Numbers of mumps and tetanus cases are summed up by the week of report.
4. Since 2020/1/15, "Severe Pneumonia with Novel Pathogens" was listed as a Notifiable Infectious Disease.

Suspected Clusters

●Fifteen clusters were reported during week 11, including 7 tuberculosis clusters, 5 diarrhea clusters, 1 upper respiratory tract infection cluster, 2 varicella clusters.

Imported Infectious Diseases

●There were 18 imported cases from 9 countries / areas during week 11 of 2020.

Countries / Areas / Diseases	Indonesia	Philippines	Netherlands	Malaysia	UK	France	Thailand	Ireland	Germany	Total
Severe Pneumonia with Novel Pathogens			2		1	1		1	1	6
Amoebiasis	3									3
Dengue Fever	1	2								3
Shigellosis	3									3
Typhoid fever	1									1
Chikungunya Fever							1			1
Zika virus infection				1						1
Total	8	2	2	1	1	1	1	1	1	18

●There are 140 imported cases from 24 different countries in 2020. The top 3 countries are Indonesia (46), Philippines (20), the China (19).

●Top 3 imported diseases are Dengue Fever (48), Severe Pneumonia with Novel Pathogens (26), Amoebiasis (22).

Summary of Epidemic

●**Severe Pneumonia with Novel Pathogens**：The risk of imported epidemic increase sharply, therefore the risk of local infection increase.

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