Tuberculosis Treatment Defaulter Survey on Koje Island

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巨濟島에서 結核 治療 中斷者에 對한 調査

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우리나라의 結核管理 事業은 政府와 大韓結核協會 및 其他機關들의 協同으로 活發히 되어지고 있으며 이를 爲하여 臨床的인 또는 基礎醫學的인 研究가 多大하였다.

慶尙南道 巨濟郡 河淸面에 位置하는 巨濟 地域社會開發 保健院은 農村地域에서 總括的인 醫藥을 베풀기 爲한 示範 事業으로 設立 되었으며 結核管理 事業에도 그 重要性을 考慮하여 많은 努力을 기울여 왔다. 그런데 아직도 治療 中斷者가 많다. 한便 該 治療를 中斷하는지에 對한 研究는 別로 活發하지 못한 實情이다.

著者等은 結核 患者가 中途에서 治療를 中斷하는 理由를 알아내어 이를 우리 事業에 feed-back하므로써 보다 效果的인 結核管理를 期하려고 이 研究를 施圖하였다. 對照群으로는 同一 地域內에서 保健所 登錄者 中 治療를 中斷한 患者를 擇하였다.

結果에서 보면 登錄된 患者의 半 以上이 適切한 治療를 받지 못하였다. 患者를 對하는 冷情한 態度나, 結核에 關한 敎育의 不充分 등으로 結核에 對한 患者들의 知識이 適當하지 못하였다고 생각할 수 있다. 即 結核을 무서워는 하지만 結核에 關하여 잘 못 알고 있거나 또는 모르고 있으며 特히 一定 期間 繼續 治療하면 大部分 完治된다는 것을 잘 모르고 있다. 그리고 經濟的인 面에서 볼 때 患者들도 治療를 爲한 支拂 能力이 있었다.

그러므로 著者等은 보다 나은 結核管理를 爲하여 住民이나 患者에게 充分한 敎育을 시키는 것이 必要하다고 본다.

아울러 患者들이 治療를 中斷하는 理由를 알아내고 이를 다시 結核 管理 事業에 反映시키기 爲한 研究가 이루어져야 겠다고 생각한다.

한便 現在 保健所를 通하여 供給되는 藥品이 充分하지 못한 것은 事實이지만, 患者도 自己 病的 治療를 爲하여 어느 程度 治療費를 支拂할 수 있는 바, 不足한 部分은 患者 스스로가 補充하여 治療한다면 所期의 成果를 거둘 수 있겠다.

I. Introduction

Tuberculosis control is one of Korea's most urgent health needs. According to the Ministry of Health and Social Affairs' 1970 prevalence survey, 4.1% of the population aged 5 years and above has active pulmonary tuberculosis.⁽¹⁾ The government, supported by the Korean National Tuberculosis Association and other voluntary agencies, has a national program for tuberculosis active case detection and domiciliary treatment for infectious cases. However, it is estimated that only 15% of the known cases complete the prescribed course of treatment.⁽¹⁾

Moreover, the experience of the Koje Community Health Project was not significantly better, where only 25% of the optimum number of return appointment for tuberculosis treatment were kept.⁽²⁾ Therefore, this study was conducted in an attempt to define the reasons most tuberculosis patients failed to complete the course of therapy.

The government health center in Koje Island, like most Korean rural health centers, has a tuberculosis treatment program following the official guidelines of the Ministry of Health and Social Affairs⁽³⁾. Case detection among the 113,000 people of Koje Island is through sputum collection by the tuberculosis health workers assigned to every myun (or township of about 10,000 population). AFB staining and microscopy is done at the health center where

direct and indirect X-ray facilities are also available. However, only about 30 X-rays are taken a week. Treatment with free INH, PAS and Streptomycin if indicated is given free to infectious cases or advanced cases of active pulmonary tuberculosis.

The Koje Community Health Project is a voluntary agency sponsored by the Christian Medical Commission of the World Council of Churches⁽⁴⁾ and is attempting to provide comprehensive medical care to about 30,000 residents of the northern 1/4 of the island (3 of 10 townships). Case detection has been primarily among self-presenting outpatients at the clinic, where during 1971 tuberculosis of the respiratory system was the fifth most common diagnosis, according for 5% of the outpatient clinic cases.⁽²⁾ Direct X-ray is almost the exclusive means of diagnosing the patient. Treatment, primarily with INH, PAS, or Streptomycin if indicated, sold at a little less than drugstore prices to all cases.

II. Method

The tuberculosis treatment defaulters from July 1970 to September 1971 living in the northern 1/2 of the island (4 townships and 1 town) were chosen from the tuberculosis registry lists of the Government Health Center and of the Community Health Project. Table 1 shows the outcome of the survey attempt. There were two attempts made to contact every subject,

Table 1. Outcome of Survey Attempt among Tuberculosis Treatment Defaulters.

	Total		Koje Project		Health Center	
	(#)	(%)	(#)	(%)	(#)	(%)
Defaulters Identified	734	100	218	100	516	100
Interviewed	278	38	96	44	182	35
Refused Interview	4	+	—	—	4	1
Error of Diagnosis	29	4	8	4	21	4
Died	41	6	5	2	36	7
Not at Home	174	23	?		?	
Moved or Address in Error	208	29	?	50	?	53

? Separate figures are not available.

initially during the period October 1 to November 3 and repeated during November 8 to 13, 1971. The high rate of those moved or not at home is thought to be in part due to local custom of temporarily moving to the mainland for treatment of severe illnesses.

III. Result and Discussion

Age, sex and occupation

About 70% of interviewees (both Koje Project and Health Center) were between 15 and 54, the age range of high productivity.

Among the project-registered defaulters, the number of males is roughly the same as females. However, among the Health Center-registered defaulters males are more than three times as many as females. According to other reports^(5,6,7) male registered patients at Health Centers are twice as numerous as females. (Table 2)

About 65% of defaulters of both institution were from farming and fishing households. Around 15% of defaulters' households were non-

occupied. Among the Health Center-registered, there are more farmers. Since, generally speaking, fishermen are more well-to-do than farmers, and it is probable that a higher proportion of the well-to-do are registered at the Koje project. A study of the Project⁽¹¹⁾ in 1969 shows that the baseline proportion in the home township of farming and fishing households is 80%.

Table 3. Occupation of Head of Household

Occupation	Koje Project (%)	Health Center (%)
Farmer	24	56
Fisherman	33	11
Farmer & Fisherman	8	—
Merchant	3	8
Government Officer	3	2
Salaryman	3	2
Non-occupied	15	17
Other and No Response	10	4
No. of People	96	182

*Those under the age of 14 were interviewed with their mothers.

Table 2. Distribution of Defaulters by Age, Sex and Myun

Koje Project								
Age	Myun					Sex		
	Hachung (%)	Yoncho (%)	Changmok (%)	Shinhyun (%)	Changseungpo (%)	M (%)	F (%)	Total (%)
0—4		11				4		2
5—14	15	11	22		23	12	22	17
15—34	39	26	39	25	18	32	30	31
35—54	27	31	28	50	55	36	35	35
55+	18	21	11	25	5	16	13	15
No. of People	33	19	18	4	22	50	46	96
Health Center								
0—4								
5—14	10	22		13	5	11	10	10
15—34	45	24	40	20	35	31	33	32
35—54	28	44	46	35	43	41	36	40
55+	17	10	14	33	16	17	21	18
No. of People	29	41	35	40	37	140	42	182

Whether the defaulters continue treatment or not.

If the registered patient was over one week or more late for his drug pick-up appointment and had not returned by the date of the survey, he was counted a defaulter. However, some of them went to other clinics, mainly on the mainland, or bought from drug stores. Therefore, defaulters at any one institution may or may not be an actual defaulter.

whether the defaulters continued treatment elsewhere was asked. It was revealed that half of Koje Project-registered defaulters continued treatment elsewhere (male 54%, female 46%), while the Health Center-registered defaulters continued at a 40% rate among males and only 12% among females. According to the 1971 out patient clinic data report of the Project⁽²⁾, patients keep 25% of optimum return appointment for Tuberculosis treatment. It was reported that 37% completed treatment with satisfactory results at private tuberculosis clinic.⁽³⁾

There is a statistically significant difference between sex and "defaulted" by institution (Chi-square, P, less than 0.025).

The Koje Project has the lowest defaulter rate in its home township of Hachung (30%) and the rate for the Health Center is lowest in its home township of Shinhyun (43%). Thus it might be interpreted that accessibility of the institution plays a role in obtaining treatment continuously.

Defaulting reasons

Why patients quit treatment is the main question in tuberculosis control. Koje Project defaulters' reasons are "too expensive", "other reason and no response" and "treating elsewhere" in sequence. Health Center defaulters said "other reason and no response", "drugs no longer given at Health Center", "recovered" and "treating elsewhere" in sequence. The Project is non-profit, but charges the patient, even though there is a discount system.

Table 4. Whether the Defaulters Continue Treatment or Not by Sex.

	Koje Project				Health Center			
	No. of People	Sex			No. of people	Sex		
		M(%)	F (%)	Total(%)		M(%)	F (%)	Total(%)
Defaulted	45	42	52	47	93	45	72	51
Continue	48	54	46	50	61	40	12	33
Recovered	1	2		1	21	11	14	12
No Response	2	2	2	2	7	4	2	4

Table 5. Whether the Defaulters Continue Treatment or Not by Myun

	Koje Project						Koje Project					
	Hachung (%)	Yoncho (%)	Changmook (%)	Shinhyun (%)	Changseungpo (%)	Total (%)	Hachung (%)	Yoncho (%)	Changmook (%)	Shinhyun (%)	Changseungpo (%)	Total (%)
Defaulted	30	58	50	75	55	47	48	59	49	43	57	51
Continue	70	32	50	25	41	50	14	26	40	48	35	33
No Response		5			5	2	3	7		5	3	4
Recovered*		5				1	34	7	11	5	5	12
No. of People	33	19	18	4	22	96	29	41	35	40	37	182

*Sometimes patients say they are recovered without confirmed diagnosis if symptoms are not significant.

Therefore it is natural that proportionally more Project defaulters say "too expensive". Health Centers distribute medicine free of charge to advanced tuberculosis patients through township health workers although not sufficient in amounts. The number of patients the Health Center can care for is quite limited, so "drugs no longer given" and "recovered" means that these patients were taken off rolls as having completed treatment, cured or not.

According to subjective experience at the Koje Project through clinic observation or follow-up services, the reasons patients give for not returning seem mostly to be short of money, transportation difficult and not ill. where money is the most frequent reason. It was reported in a socioeconomical survey⁽⁹⁾ in Seoul that about one third defaulted due to economic reason and one fifth because they were too busy and not ill.

Through this survey and clinical experience in Koje Island, it is thought that there is several defaulting reasons, but that tuberculosis patients don't have enough information about their disease and its nature, treatment and prevention. As for the money, as it will be explained later, most patients will pay for treatment if they understand and convinced that tuberculosis can be cured within 1 to 2 years with adequate treatment.

Institution where first diagnosed

This question was asked to determine whether

Table 6. Defaulting Reason

Defaulting Reason	Koje Project (%)	Health Center (%)
Treating Elsewhere	17	16
Not Ill	6	8
Too Expensive	25	3
Too Busy	6	1
Too Far	6	1
Treatment Not Good	6	9
Misdiagnosis	3	1
Recovered ¹⁾	2	17
Unknown	8	6
Drugs No Longer Given ²⁾	—	18
Others, No Response	22	21

- 1) Sometimes patients are told that they are not ill anymore without confirmed diagnosis at Health Center.
- 2) Drugs are not distributed by tuberculosis health workers if Government's drug supply is short.

tuberculosis patients get treatment continuously at the same institution. By and large, many people tend to go to another clinics or institutions to confirm their disease. So some of defaulters in one clinic may be registered at another institution.

Among Koje Project-registered defaulters, about 60% were diagnosed at the Project. But only 49% were diagnosed first at the Koje Project who live in Hachung (home township of the project) and 33% were diagnosed at the mainland.

Among Koje Health Center-registered defaulters, about 70% were diagnosed first at Koje

Table 7. Institution Where First Diagnosed by Myun

Diagnosed Institution	Koje Project						Health Center					
	Hachung (%)	Yoncho (%)	Changmook (%)	Shinhyun (%)	Changseungpo (%)	Total (%)	Hachung (%)	Yoncho (%)	Changmook (%)	Shinhyun (%)	Changseungpo (%)	Total (%)
Koje Project	49	79	78	75	55	63	7	2		3	11	4
Health Center	12	11	11	25	18	14	69	78	57	82	54	69
Other Clinics in Koje	6	5	11			3		5	6	3	11	5
Mainland	33	5			23	19	21	12	37	13	22	20
Don't Know					5	1	3	2			3	2
No. of People	33	19	18	4	22	96	28	41	35	40	37	182

Health Center. Of those who live in Shinhyun (where the Health Center is) 82% were diagnosed there first, a pretty high rate. The percentages diagnosed first at Health Center rank Shinhyun, Yoncho, Hachung and Changmok townships in order which is also the rank order of remoteness from the Health Center. Considering that only about 50% of Seoul Health Center patients were diagnosed first at that Health Center,^{9,10)} higher percentages are consistently using the Government Health Center in Koje island than in Seoul.

Name of first diagnosed disease and treatment

In order to know how much defaulters understand of their disease, interviewees were asked to name their disease. Since less educated people still to some extent think that they would be confined in sanatoria if they become known to have tuberculosis. So physicians don't like to name tuberculosis directly but say instead that one's lungs are a little bad.

About 80% of Health Center-registered defaulters knew that their disease is tuberculosis or "pulmonary disease" (usually in Korea pulmonary tuberculosis is called "pulmonary disease"), however, only 66% among the Koje Project-registered defaulters admitted they knew their disease as tuberculosis or pulmonary disease. There were 17% naming another disease at the Project. But we must consider that 10% of Project tuberculosis is of non-respiratory systems, and that the patient may think of tuberculosis of other system as another disease.

What drugs were prescribed at the institution

Table 8. Name of First Diagnosed Disease

	Koje Project (%)	Health Center (%)
Tuberculosis	44	41
Pulmonary Disease	22	38
Not Heard	6	4
Other Disease	17	6
Don't Know	11	11
No. of People	96	182

of first diagnosis was questioned. Among Koje Project-registered defaulters, the triple regimen (INH, PAS and Streptomycin) was named most, and both triple regimen and two drug regimen (INH and PAS) together account for 50%. One third of the defaulters did not know what drugs were prescribed, however, some of them remembered that 3 tab/day, 20 tab/day or a certain injection was ordered. As we may have supposed, INH is the most frequently (35%) prescribed drug at the Health Center.

Table 9. Prescribed Drug

	Koje Project (%)	Health Center (%)
INH	6	35
SM	1	
PAS	1	4
INH+PAS	21	13
INH+PAS+SM	28	14
INH or PAS+SM	3	10
Nothing	6	3
Other Drugs		1
Don't Know	33	19
No. of People	96	182

The recommended period for taking the prescribed medicine was asked, and varied in percentage. Half of the defaulters, both at the Project and the Health Center, said that they did not hear a recommended period for taking medicine. Surprisingly and regrettably, very

Table 10. Recommended Period of Taking Prescribed Medicine

	Koje Project (%)	Health Center (%)
Didn't tell	48	48
1-3 mo.	6	2
4-6 mo.	16	6
7-9 mo.	2	
10-12 mo.	7	8
13-18 mo.		1
19-24 mo.	1	3
25+ mo.	6	2
Don't know	13	30
No. of People	96	82

few among interviewees knew that tuberculosis medication must be taken for more than a year.

Knowledge of tuberculosis

Three categories of questions were asked to determine knowledge of tuberculosis: relative knowledge about tuberculosis vs. other dread disease, knowledge of the consequences of tuberculosis and knowledge of the transmission of tuberculosis.

1. Relative knowledge of tuberculosis vs. other dread diseases

Several diseases were arbitrarily chosen which rural people might think of as dreadful. In order to analyse relative dread, a score was made: tuberculosis is more dreadful, "+1", about same and don't know, "0", and tuberculosis is less dreadful, "-1".

A higher score means that tuberculosis was said to be more dreadful than the reference disease. A negative score indicates that the reference disease was said to be more dreadful.

The descending sequence of scores is shown below.

The sequence of these "dread" scores in both institutions, is the same except for one place reverse between pertussis and measles on one end and between poliomyelitis and leprosy on the other.

A Health Interest Survey done by the Chung-

nam Provincial Government and WHO Team⁽¹²⁾ in 1964 reported that tuberculosis is the most disliked disease with leprosy and typhoid next in order. The pattern is quite similar in this study.

Regarding measles and pertussis, infants and children are commonly infected. For example, there is an old saying in Korea that if man does not catch it during his life, he would catch measles in the grave. So, even though measles and pertussis claim a high fatality rate among infants and children, its inevitability in childhood and infancy and its low incidence in an adult population minimize fear.

Table 12. Descending Sequence of Scores

Sequence	Koje Project		Health Center	
	Disease	Score	Disease	Score
1	*Measles	+46	*Pertussis	+58
2	*Pertussis	+44	*Measles	+53
3	Neuralgia	+38	Neuralgia	+50
4	Fracture of Arm	+27	Fracture of Arm	+37
5	Febrile Disease	+24	Febrile Dis.	+21
6	Arthralgia	+18	Arthralgia	+10
7	*Leprosy	+11	*Poliomyelitis	+7
8	*Poliomyelitis	-2	*Leprosy	+3

2. Knowledge of the consequences of tuberculosis

There is little difference between Koje Project and Health Center defaulters in the knowledge

Table 11. Relative Knowledge of Tuberculosis vs. Other Dread Diseases

	Koje Project				Health Center			
	TB is more dreadful (%)	About same (%)	TB is less dreadful (%)	Don't know (%)	TB is more dreadful (%)	About same (%)	TB is less dreadful (%)	Don't Know (%)
Leprosy	40	10	29	20	35	18	32	15
Febrile Disease (Typhoid)	47	7	23	23	48	10	27	15
Arthralgia	43	8	25	24	34	18	24	24
Poliomyelitis	30	17	32	20	37	12	30	20
Pertussis	58	10	14	18	66	12	8	14
Fracture of Arm	51	6	24	19	57	5	20	18
Measles	62	1	16	22	66	5	13	15
Neuralgia	59	3	21	17	68	6	12	15

of the consequences of tuberculosis, except that a higher proportion of Health Center patients said tuberculosis causes "discomfort" and is "debilitating". We may suppose that among the Koje Project defaulters that minimal and moderate cases are predominant, while proportionally more sputum positive or advanced cases are registered at the Health Center.

3. Knowledge of the method of transmission of tuberculosis

"Yes" is the correct answer in items c, d and g in Table 14, while, "No" is correct in items a, b, e and f. The average correct answer score is 52% among Koje Project-registered defaulters, while 54% is average among Health Center-registered defaulters, and the average number

of "Don't know" responses for each of the 7 items was 16% and 12% respectively. According to a study⁽⁹⁾ less than 60% of Health Center patients understood the source of transmission.

It is surprising that interviewees would have so little correct information about one of the most dread diseases in the country.

Present treatment

Half of those who defaulted from the Koje Project were taking medicine elsewhere at the time of the survey. Only one third of defaulters from Health Center treatment were taking medicine elsewhere.

More than two thirds of Koje Project defaulters who continued treatment elsewhere were taking double or triple regimens, however, two thirds of the Health Centers defaulters taking

Table 13. Knowledge of the Consequences of Tuberculosis (%)

	Koje Project			Health Center		
	Yes(%)	No(%)	Don't Know (%)	Yes(%)	No (%)	Don't Know (%)
Can cause death	46	46	8	41	55	4
Painful	22	69	9	18	76	6
Causes discomfort	58	32	9	78	18	4
Debilitating	52	42	6	67	29	4
Agonizing	66	26	8	75	19	6
Can not be treated	8	82	9	8	86	6

Table 14. Knowledge of the Method of Transmission of Tuberculosis

	Koje Project			Health Center		
	Yes(%)	No(%)	Don't Know (%)	Yes(%)	No(%)	Don't know (%)
a) Through taking the patient's meal	52	31	17	61	5 ²	14
b) Through using the patient's utensil	49	34	17	60	29	12
c) Through cough	65	21	15	71	17	12
d) Through spitted sputum	58	26	16	64	24	12
e) Through drinking contaminated water	39	43	18	40	42	18
f) Congenitally	19	62	20	19	69	13
g) Infected to family	74	17	9	81	13	6

treatment elsewhere were getting only INH.

In any case, about 40% of Project defaulters and 60% of Health Center defaulters were not taking any medicine at all.

Table 15. Medicine Taking Now

	Koje Project (%)	Health Center (%)
INH	9	20
PAS	5	1
SM	1	1
INH+PAS	20	9
INH+PAS+SM	18	1
INH or PAS+SM	1	1
Nothing	42	62
No Response, Don't Know	5	6
No. of People	96	182

Ability to pay for the treatment monthly

The question "How much could you pay a month for cure over one to two years?" was asked.

Fifty percent of Koje Project-registered defaulters replied that they could pay 500 Won (400 Won = \$1, June 1972) or more. The average was 571 Won including those who said they could pay nothing. Thirty seven percent of Health Center-registered defaulters replied that they could pay 500 Won or more, and the average was 491 Won.

Graph 1. Ability to Pay for the Treatment by Month

The actual cost at Koje Project for two years of a triple drug regimen, including good physician care, X-ray every 6 months, sputum tests every 3 months, 2 X-rays for family contacts, and PPD and BCG vaccination for all children in the family is 20,000 Won. As a first course, no other regimen is better even including hospitalization (Madras study⁽⁴⁾). Therefore the cost per month is only 800 Won (standard drugstore prices are only slightly higher), which includes X-ray and BCG vaccination for family contacts.

Double therapy, which is almost as efficacious, including complete tuberculosis family service,

Graph 2. Patients Further Treatment Plans

would cost only 16,000 Won or 670 Won a month.

Therefore, the rural economy can very neatly pay for complete tuberculosis care, especially if government drugs were separately obtained at the Health Centers.

Comparing costs, tuberculosis is no more expensive than an appendectomy, and considerably less expensive than illnesses treated with good in-patient care.

Further treatment plan

Seventy percent of Koje Project and 60% of Health Center-registered defaulters claimed they would continue treatment. All were urged to continue by the survey team. (Graph 2)

IV. Conclusion

Tremendous efforts have been made on tuberculosis control since the national tuberculosis control program was initiated. Mass screening, improvement of diagnostic skills, clinical efforts for better chemotherapy, and free distribution of tuberculosis drugs through Government Health Centers have all been instituted. Such kinds of endeavor have, of course, played an important role in the tuberculosis control program.

However, if patients do not have sufficient knowledge about disease transmission, how long medicine has to be taken, and how to be treated optimally, control of tuberculosis will be much less effective and much more difficult.

Through this survey, it was recognized that more than half of the registered patients were not receiving optimal treatment, though no one reason for defaulting was significant. Lack of a sympathetic attitude at treatment institutions and the failure to provide adequate information may account for the knowledge of tuberculosis being poor as expected. However, the ability to pay for treatment, as revealed by the survey, was higher than expected. Therefore the survey served a dual purpose: to research defaulters'

knowledge and attitude, and to home visit, educate, and motivate proper tuberculosis treatment.

「The facts that people dread tuberculosis and are misinformed about tuberculosis have such a poor record of staying on treatment long enough to realize what should be a 90% or higher recovery rate. The authors suggest that people

- 1) dread tuberculosis,
- 2) have misinformation and lack good information on tuberculosis,
- 3) have a very poor record for continuing treatment long enough to realize what could be a 90% or higher cure rate,
- 4) have enough money to pay for the best tuberculosis treatment, especially with Health Center aid, and
- 5) medicine and physicians are widely available all over the country.

It would seem to the authors that a tuberculosis information campaign is needed more than any other single measure.

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유신 과업 이룩하여

민주 주의 토착하자