

A Clinico-Epidemiological Study on Farmers Working in a Vinyl House

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Introduction

In Korea rural area has been changed markedly in relation to developments of agricultural technology and advanced economic growth.

Health problem in rural district is increased due to new agricultural technology, mass use of pesticide, accidents by agricultural machines, and pollution by factories in rural area.

The recent urbanization of rural communities and the associated changes of the living environment also influence the health conditions of farmers in rural district, and they present many symptoms of different varieties.

Cultivation method in a vinyl house was firstly introduced in 1967, and this method is used widely at present in Korea.

The period of cultivation in a vinyl house is from November to next April.

This season is cold in usual in Korea, but the temperature and humidity inside a vinyl house is very high with poor or no ventilation at all.

Most of the vinyl houses are very small in scale. Naturally working in these small vinyl houses causes many health problems. Besides pesticide remaining in a vinyl house is the another problem.

Comparison between farmers working in vinyl houses and in open fields, the former frequently complain of many subjective symptoms, and the incidence of respiratory disease in winter and of gastro-intesti-

nal disease in summer is higher.

Vinyl house disease is a kind of occupational disease and symptom complex which develops while working in a vinyl house.

The purpose of this study is to make clear causes of the so-called vinyl house disease and to make prevention against vinyl house disease.

Materials and Methods

This survey was carried out in GaLak area, which is a small rural community but a pioneer in vinyl house farming in Korea.

Their economy is largely based on agriculture dominated by farming in a vinyl house.

This study comprised a total of 150 farmers (Male 63, Female 87) and 47 vinyl houses.

The clinical part of this study was questionnaire survey based on interviews.

Our study was chiefly composed of status of vinyl houses not farmers.

We didn't investigate the objective physical and laboratory findings of farmers working in a vinyl house.

We are planning to study above factors in the near future.

Summary of the Results

Working hours were almostly 2-4 hours once, and most of farmers worked in a vinyl house over twice

a day (Table 1, 2).

Temperature in a vinyl house was up to 32 degree centigrade, and humidity was up to 90% (Table 3).

The average height of a vinyl house was 180cm and width was 400cm (Table 4).

Frequency in spraying pesticide was once a month 7%, twice 13%, three times 27%, four times 30%, and over four times 15% respectively (Table 5).

The rate of farmers not wearing a mask during spraying pesticide was 71% and the rate of farmers entering a vinyl house within an hour after spraying pesticide was 39% (Table 6, 7)

Their presenting symptoms were sweating(98%), back pain(92%), dizziness(86%), headache(83%), myalgia(81%), dyspnea(78%), vomiting(44%).

Their symptoms were increased in related to working hours in a vinyl house (Table 8).

Their managements with above symptoms were resting at home(38%), taking medicine(34%), continuing working(27%) and visiting doctor(1%) (Table 9).

Above data suggested that major causes of vinyl house disease were high temperature and humidity in a vinyl house, remaining pesticide, and small-scale vinyl house.

Table 1. Working hours at one time

Hours	1	2	3	4	Over 4	Total
No.	16	50	38	30	16	150
Rate(%)	11	34	25	20	10	100

Table 2. Frequency in entering a vinyl house per day

Frequency	1	2	3	4	Over 4	Total
No.	1	30	53	41	25	150
Rate(%)	0.7	20	35	27.3	17	100

Table 3. Average temperature and humidity in a vinyl house

Time	9-12AM	12-3PM	3-6PM
Temperature(°C)	20-27	30-33	23-24
Humidity(%)	80-90	65-75	75-80

Table 7. Re-entering time after spraying pesticide

Hours	1 hr after	2 hrs	3 hrs	4 hrs	Total
No.	59	22	42	27	150
Rate(%)	39	15	28	18	100

Table 8. Major symptoms

Symptoms	Sweating	Backpain	Arthralgia	Dizziness	Headache	Myalgia	Dyspnea	Mausea
No.	147	138	32	129	124	121	117	67
Rate(%)	98	92	88	86	83	81	78	44

Table 9. Period of cultivation in vinyl house

Periods(yrs)	1-5	5-10	10-15	Over 15	Total
No.	30	78	39	3	150
Rate(%)	20	52	26	2	100

Table 4. Average scale of a vinyl house

Height	Width	Length	Shape
1.80-1.85m	4m	70-100m	semi-circle

Table 5. Frequency in spraying pesticide per month

Frequency	1	2	3	4	Over 4	Total
No.	10	19	41	47	23	150
Rate(%)	7	13	27	38	15	100

Table 6. Wearing mask while spraying pesticide

	Yes	No	Total
No.	43	107	150
Rate(%)	29	71	100

Table 10. Relationship between period of cultivation and severity of symptoms

Severity	More severe	Same	Less severe	Total
No.	81	61	8	150
Rate(%)	54	41	5	100

Table 11. Rest at a vinyl house after working

Rest	Yes	No.	Total
No.	26	124	150
Rate(%)	17	83	100

Table 12. Managements

Management	Visiting a doctor	Taking medicine	Resting at home	continuing working	Total
No.	1	51	57	41	150
Rate(%)	1	34	38	27	100

Discussion

1. Causes of vinyl house disease.

It is very hot and humid environment in a vinyl house. The average temperature is 30 to 35 Working in such a hot environment causes problems in heart and liver, and dehydration by excessive sweating.

The average humidity is 75 to 85 percent.

Water vapor can not be permeated through vinyl materials, as a result the humidity is increased.

Since the difference in temperature & humidity between inside and outside of vinyl house is very high, the adaptation is very hard for farmers.

Ventilation is poor.

The oxygen concentration in a vinyl ouse is low, so hypoxic symptoms develop.

Spraying pesticide in a vinyl house is another problem.

Pesticide is sprayed too much and frequently, so it remains for a long time inside vinyl house. In addition protection against poisoning is very poor during or after spraying pesticide.

Working in a small-scale vinyl house makes farmers flexion position.

Flexion position causes back pain and arthralgia.

Chronic fatigue is another cause. Continuing working even in leisure season for farming cases chronic

fatigue.

All of the above factors give rise to vinyl house disease.

Prevention

Supplementary room where farmers can take rest for 10 to 15 minutes before or after work should be established beside a vinyl house to accommodate the change in temperature and humidity.

The size of vinyl house should be made bigger and should provide windows for ventilation.

The vinyl house should be ventilated completely after spraying pesticide to eliminate any residue, and farmers should go into the vinyl house after adequate ventilation.

□ 國文抄錄 □

“비닐 하우스”에서 일하는 농부에 관한
임상 역학적 연구

마산의료원, 농촌의학 연구소

선 명 훈

최근에 한국에서 비닐 하우스에서 일하는 농부가 증가하며, 거기에 비례하여 많은 질병을 호소하고 있다.

그래서 저자는 비닐 하우스에서 일하는 150명의 농부에 대하여 임상 역학적 연구를 실시하였다.

그 결과는 다음과 같다.

1) “비닐 하우스”내에는 작업시간은 대부분의 농민이 1회에 2-4시간이며 1일 2회 이상 출입하고 있다.

2) “비닐 하우스” 내부의 온도는 섭씨 32°이상이며, 습도는 90%이상이었다.

3) “비닐 하우스”의 크기는 높이가 180cm이며, 넓이가 400cm인 반원형이다.

4) “하우스”내부에서의 농약 살포는 월1회(7%), 2회(13%), 3회(27%), 4회(30%), 그이상(15%)였다.

5) 농약 살포시 “마스크”를 착용하지 않는 농민이 71%이며, 농약을 살포한 후 1시간이내에 “비닐 하

우스”내에 후입하는 농민은 39%였다.

6) “하우스” 재배 농민들이 호소하는 주요 증상은 발한(98%), 요통(92%), 현기증(86%), 두통(83%), 근육통(81%), 호흡곤란(78%), 구토(44%)이며, 이러한 증상들은 “비닐 하우스”내에서 작업하신 시간에 비례하여 증가하였다.

7) 이러한 증상들에 대한 농민들의 처치방법은 집에서 휴식 및 안정을 취한다. 약을 사먹는다(34%), 계속 작업을 한다(27%). 의사를 찾아간다(1%) 이었다.

이상과 같은 결과로 볼때 “비닐 하우스”병의 주요원인은 “비닐 하우스” 내부가 고온, 다습한 환경이며, 비닐 하우스 “내부에서 농약 살포와 협소한 작업환경 때문이라는 것을 알게 되었다.