

Studies on the Health Status and Health Management Plan Using Health Check - up Index of Male Petroleum Refinery Workers in South Korea

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Abstract

The petroleum refinery industry handles a variety of complex chemical substances and employs a large number of people around the world. According to previous research, diseases caused by exposure to chemicals were quite common among workers in refineries until the 1980s. More recently, it is unusual for oil refinery workers to suffer from these serious diseases. The objective of this study was to identify the occurrence level of general diseases and any differences in lifestyle habits of workers in refineries in Korea compared with the general population. In this study, we used the results of health examinations from 2014 for workers at a large oil refinery in South Korea. In addition, based on the results of KNHANES from 2014 as representative of the population, hypertension, diabetes, anemia, hyperlipidemia, liver function abnormality, and kidney function abnormality were calculated using the standardized incidence rate. Hypertension showed a low result with an SIR of less than 1, but a high result in the case of abnormal liver function. The workers' occurrence rates of hypertension, hyperlipidemia, kidney dysfunction, and anemia were lower than those of ordinary salaried employees. however, their occurrence rate for abnormal liver function was markedly higher. In lifestyle habits, the smoking rate of workers was low while the alcohol consumption rate was quite high. This study has improved the understanding of the health status of workers in a large oil refinery in Korea, and has shown the impact of lifestyle habits related to the work environment on chronic diseases.

Keywords : Petroleum refinery industry, South Korea, KNHANES, Lifestyle, Working conditions, Chemical exposure

1.

[1 - 4]

가

[5 - 8]

1980

[5-9]

가

[10-13]

[14-15] solvents,
lubrication - oil bases, oils, waxes, paraffin
benzene, toluene and xylene (BTX)

[16-18]

가

[19-21] 가

100ppm 1930 가

0.5ppm ACGIH [22-25]

[26]

[24,27]

[28,29]

[30,31] 가

[32]

2.

2014

가 가 가

[33]

6가

가

6가

ACGIH [22-25]

[26]

[24,27]

3.

3.1

1,199

20 60

647

20 60

<Table 1> General Characteristics of Petroleum Refinery
Factory Workers (2014)

variable	Category	2014	
		N	%
Ages	20 - 24	9	0.75
	25 - 29	154	12.84
	30 - 34	220	18.35
	35 - 39	90	7.51
	40 - 44	248	20.68
	45 - 49	184	15.35
	50 - 54	157	13.09
	55 - 59	121	10.09
	60 - 64	16	1.33

Life Style	Smoking	No	775	64.64
		Current	424	35.36
	Alcohol	Adequate	541	45.12
		Inadequat	658	54.88
	Exercise	Adequate	665	55.46
		Inadequat	534	44.54
Abnormality	Hypertension		136	11.34
	Diabetes		528	44.04
	Anemia		12	1.00
	Hyperlipidemia		288	24.02
	Liver function		190	15.85
	Kidney function		7	0.58
Total			1,199	100.00

<Table 2> General Characteristics of Current Salary Workers in KNHANES (2014)

variable	Category	2014		
		N	%	
Ages	20 - 24	13	2.01	
	25 - 29	42	6.49	
	30 - 34	117	18.08	
	35 - 39	118	18.24	
	40 - 44	104	16.07	
	45 - 49	73	11.28	
	50 - 54	74	11.44	
	55 - 59	68	10.51	
	60 - 64	38	5.87	
Life Style	Smoking	No	358	55.33
		Current	289	44.67
	Alcohol	Adequate	578	89.34
		Inadequat	69	10.66
	Exercise	Adequate	529	81.76
		Inadequat	118	18.24
Abnormality	Hypertension		94	14.53
	Diabetes		199	30.76
	Anemia		44	6.80
	Hyperlipidemia		251	38.79
	Liver function		63	9.74
	Kidney function		2	0.31
Total			647	100.00

<Table 3> Standardized Incidence Rate of 3 Categories (Hypertension, Diabetes, Anemia) of Abnormalities by KNHANES (2014)

Abnormalities	Category	Hypertension				
		KNHANES		Workers		SIR
		N	%	N	%	
Ages	20 - 24	0	0.00	0	0.00	-
	25 - 29	2	0.31	6	0.50	0.82
	30 - 34	10	1.55	18	1.50	0.95
	35 - 39	17	2.63	6	0.50	0.46
	40 - 44	21	3.25	35	2.92	0.70
	45 - 49	17	2.63	31	2.59	0.72
	50 - 54	13	2.01	24	2.00	0.87
	55 - 59	11	1.70	15	1.25	0.77
	60 - 64	3	0.46	1	0.08	0.77
Total		94	14.53	136	11.34	0.78
Abnormalities	Category	Diabetes				
		KNHANES		Workers		SIR
		N	%	N	%	
Ages	20 - 24	1	0.15	2	0.17	3.04
	25 - 29	3	0.46	31	2.59	2.85
	30 - 34	23	3.55	64	5.34	1.48
	35 - 39	37	5.72	35	2.92	1.24
	40 - 44	30	4.64	118	9.84	1.65
	45 - 49	26	4.02	97	8.09	1.48
	50 - 54	28	4.33	94	7.84	1.58
	55 - 59	31	4.79	76	6.34	1.38
	60 - 64	20	3.09	11	0.92	1.31
Total		199	30.76	528	44.04	1.43
Abnormalities	Category	Anemia				
		KNHANES		Workers		SIR
		N	%	N	%	
Ages	20 - 24	4	0.62	0	0.00	-
	25 - 29	1	0.15	0	0.00	-
	30 - 34	5	0.77	0	0.00	-
	35 - 39	5	0.77	1	0.08	0.25
	40 - 44	8	1.24	1	0.08	0.05
	45 - 49	6	0.93	2	0.17	0.13
	50 - 54	2	0.31	2	0.17	0.48
	55 - 59	10	1.55	5	0.42	0.28
	60 - 64	3	0.46	1	0.08	0.77
Total		44	6.80	12	1.00	0.15

3.2

가
0.58%
가
38%
가
0.31%

3.3

0.78

<Table 4> Standardized Incidence Rate of 3 Categories
(Hyperlipidemia, Liver function, Kidney function) of
Abnormalities by KNHANES (2014)

Abnormalities	Category	Hyperlipidemia				
		KNHANES		Workers		SIR
		N	%	N	%	
Ages	20 - 24	5	0.77	0	0.00	-
	25 - 29	4	0.62	16	1.33	1.08
	30 - 34	41	6.34	41	3.42	0.53
	35 - 39	53	8.19	21	1.75	0.52
	40 - 44	43	6.65	68	5.67	0.66
	45 - 49	34	5.26	57	4.75	0.66
	50 - 54	33	5.10	53	4.42	0.76
	55 - 59	27	4.17	28	2.34	0.58
	60 - 64	11	1.70	4	0.33	0.86
Total		251	38.79	288	24.02	0.62
Abnormalities	Category	Liver function				
		KNHANES		Workers		SIR
		N	%	N	%	
Ages	20 - 24	0	0.00	1	0.08	-
	25 - 29	5	0.77	10	0.83	0.54
	30 - 34	17	2.63	34	2.84	1.06
	35 - 39	16	2.47	16	1.33	1.31
	40 - 44	12	1.85	56	4.67	1.96
	45 - 49	1	0.15	38	3.17	15.53
	50 - 54	3	0.46	17	1.42	2.70
	55 - 59	6	0.93	15	1.25	1.40
	60 - 64	3	0.46	3	0.25	2.40
Total		63	9.74	190	15.85	1.63
Abnormalities	Category	Kidney function				
		KNHANES		Workers		SIR
		N	%	N	%	
Ages	20 - 24	0	0.00	0	0.00	-
	25 - 29	0	0.00	0	0.00	-
	30 - 34	0	0.00	0	0.00	-
	35 - 39	1	0.15	0	0.00	-
	40 - 44	0	0.00	1	0.08	-
	45 - 49	1	0.15	0	0.00	-
	50 - 54	0	0.00	4	0.33	-
	55 - 59	0	0.00	2	0.17	-
	60 - 64	0	0.00	0	0.00	-
Total		2	0.31	7	0.58	1.87

4.

[28,29]

가 가

가

가

80%가

40

가

20

20

15.53

55%

0.62

가 40 가

. 20

가

1

가 가

가

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