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Abstract

Surveillance of Work-related Diseases in Kumi

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Objectives: Area-based occupational disease surveillance in Kumi (KODS) was used to collect data on occupational diseases. The data was used to estimate the magnitude of the diseases, to analyze for their characteristics, and to find links for their intervention and prevention.

Methods: Since January 2001, occupational physicians and nurses in Occupational Health Service (OHS) have reported six major occupational diseases; occupational musculoskeletal disorders of the upper extremities (MSDUE), occupational dermatoses, toxic hepatitis, occupational asthma (OA), hand-arm vibration syndrome (HAVS), and occupational cancer. For the respective diseases, a reporting sheet and operational diagnostic criteria were developed by the KODS. An analysis of the KODS data, collected over a certain period, was compared with data from the Korea Labor Workers Corporation (KLWC) and the Specific Health Examination (SHE), and the incidence rates of the diseases estimated.

Results: Between Jan 2001 and Apr 2002, 287 cases of the six major occupational disease were reported. Of these, there were 132 (46.0%), 100 (34.8%), 34 (11.8%), 16 (5.6%), and 5 (1.7%), cases of MSDUE, occupational dermatoses, toxic hepatitis, OA, and HAVS, respectively. But, there were no cases of occupational cancer. 33 (11.5%) of the incidence were reported via the OHS, 206 (71.7%) from health checkups, and the other 48(16.8%) from other routes. The synthetic fibers and electronic components manufacturing industries accounted for the greatest number of reported cases. With respect to occupation, the greatest numbers of incidence were reported from the elementary occupations, textile workers, assemblers, and cooks and food services worker, in that order. Of the MSDUE cases, carpal tunnel syndrome and epicondylitis were the two most common diseases. Most of the occupational dermatoses were due to contact dermatitis, with organic solvents (59%), nickel (6%), and epoxy resin (5%) accounting for the majority of these cases. All cases of toxic hepatitis were induced by dimethylformamide or dimethylacetamide, which were reported by a unique monitoring system. During same period, there were no cases claimed by workers to the KLWC, and only three cases from SHE, were identified. Using data from workers' number and surveillance, the annual incidences of MSDUE, dermatoses, hepatitis, OA, and HAVS, per 100,000 workers were 63.6, 48.2, 17.9, 7.7, and 2.4, respectively.

Conclusions: These results show that an area-based surveillance system can be very effective for the collection of data on work-related diseases, at least in Kumi.

Key Words: Surveillance, Occupational diseases

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(Matte , 1989; Baker, 1987),
Condition-specific surveillance

(Cherry , 2000a;
Cherry , 2000b; Meyer , 2000; Meyer ,
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Table 1. Occupational diseases reported by primitive surveillance system in Kumi, 2000

Disease	Cases	(%)	Agent
Toxic hepatitis	21	38.2	DMAC
Contact dermatitis	18	32.7	Epoxy Resin, Solvents etc.
MSDUE*	15	27.3	
Occupational Asthma	1	0.0	Flux fume(Rosin)
Total	55	100.0	

*: MSDUE, occupational musculoskeletal disorders of the upper extremities

가 144
 (50.2%), 143 (49.8%),
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 2001.1.1 2002.4.30 287
 132 (46.0%), 20 30 가 , 60
 100 (34.8%), 34 10 (Table2).
 (11.8%), 16 (5.6%), 1
 5 (1.7%) 33 (11.5%)
 가
 21.6% 68.6% 가 206
 (71.7%)

Table 2. Results of diseases by reliability, sex, age, and reporting method[†]

	MSDUE	Dermatoses	Toxic hepatitis	Asthma	HAVS	Total
Reliability						
Definite	33 (25.0)	-	27 (79.4)	-	2 (40.0)	62(21.6)
Probable	81 (61.4)	96 (96.0)	7 (20.6)	11 (63.6)	2 (40.2)	197(68.6)
Possible	18 (13.6)	4 (4.0)	-	2 (12.5)	1 (20.0)	25(8.7)
Suspected	-	-	-	3 (18.8)	-	3(1.0)
Sex						
Male	54 (40.9)	48 (48.0)	24 (70.6)	13 (81.2)	5 (100.0)	144(50.2)
Female	78 (59.1)	52 (52.0)	10 (29.4)	3 (18.8)	-	143(49.8)
Age						
< 20	3 (2.3)	7 (7.0)	4(11.8)	-	-	14(4.9)
20~29	32 (24.2)	55(55.0)	7(20.6)	5 (31.3)	-	99(34.5)
30~39	25(18.9)	29(29.0)	7(20.6)	9(31.3)	3(60.0)	73(25.4)
40~49	44(33.3)	6(6.0)	7(20.6)	2(12.5)	1(20.0)	60(20.9)
50~59	26(19.7)	-	5(14.7)	-	-	31(10.8)
> 60	2(1.5)	3(3.0)	4(11.8)	-	1(20.0)	10(3.5)
Reporting method						
Medical checkup except mandatory checkup	105(79.6)	86(86.0)	5(14.7)	9(63.4)	1(20.0)	206(71.7)
OEM clinic	2(1.8)	-	-	2(12.5)	-	4(1.4)
OHS						
Doctor	3(2.3)	7(7.0)	-	2(12.5)	3(60.0)	15(5.2)
RN	18(13.6)	-	-	-	-	18(6.3)
RN of workplace	4(3.0)	7(7.0)	1(2.9)	1*(6.3)	-	13(4.5)
Other clinic	-	-	-	2(12.5)	1(20.0)	3(1.0)
Monitoring	-	-	28(82.4)	-	-	28(9.8)
Total	132 (100)	100 (100)	34 (100)	16 (100)	5 (100)	287(100)

*; reported case by non-medical person

[†]; MSDUE, occupational musculoskeletal disorders of the upper extremities; HAVS, hand-arm vibration syndrome

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Table 3. Distribution according to the Korean Standard Classification of Industry

Type of industry	Frequency
Manufacture of synthetic fibers	76
Cotton spinning	10
Manufacture of other made-up textile articles	12
Manufacture of electronic components	59
Manufacture of other electronic components	30
Personnel supply services	12
Restaurants, bars, and canteens	17
Manufacture of rubber and plastic products	13
Others	58
Total	157

42 (33%),
 39 (30%) 가 ,
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Table 4. Distribution according to the Korean Standard Classification of Occupation

Type of occupation	Frequency
Elementary occupations	101
Textile fiber preparing and processing machine operators	57
Assemblers	37
Cooks and foods services workers	27
Office related clerks	13
Metal electroplating and cleaning machine operators	11
Others	41
Total	222

Table 5. Diseases of musculoskeletal disorders

Disease	Frequency	Percentage for reported cases
Carpal tunnel syndrome	42	31.8
Epicondylitis (lateral and medial)	39	29.5
Tendinitis (supra- & infra-spinatus, rotator cuff, etc.)	19	14.4
Ganglion	10	7.6
DeQuervain's disease	4	3.0
Myofacial pain syndrome	4	3.0
Ulnar nerve entrapment syndrome	3	2.2
Trigger finger	2	1.5
Others (shoulder pain, unclassified etc.)	21	15.9
Total	144	100.0

Table 6. Agents of occupational dermatoses

Suggested agent	Frequency	%
Solvents (DMAC, oil mist, alcohol, cutting oil, xylene, TCE etc.)	59	59.0
2,5-hexanedione	3	3.0
Nickel	6	6.0
Epoxy resin	5	5.0
Rubber glove	2	2.0
Graphite dust	1	1.0
Flux (rosin)	1	1.0
Paint(Urethan pigment)	2	2.0
Glass fiber	1	1.0
Physical irritation (mask, anti-dust clothes)	2	2.0
Chemicals(HCl, HF, NOx etc.)	4	4.0
Others(aroma oil, ciment, lamination resin etc.)	14	14.0
Total	100	100.0

Table 7. Agents of occupational asthma

Suspected agent	Frequency	%
MDI	3	18.8
Reactive dye	2	12.5
Grain dust	2	12.5
Flux	2	12.5
Others (Ceramic dust, Herb, Ciment, Solvent, Indoor dust, Paint, Natural rubber)	7	43.7
Total	16	100.0

(Table 7).

2) 가 , 가 59 (59%) 가 .

가 , 6 5 . 4) (dimethylformamide, DMF) DMAc 2 34

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(Table 8).

3) 16 , 2 , 5 ,

MDI가 3 , 2 , 2 1

2 , 2 가 1 가 (, 2002b).

Table 8. Latency period among toxic hepatitis

Working duration (month)	Frequency
1	10
1 ~ < 2	11
2 ~ < 3	9
3 ~ 6	4
Total	34

Table 9. Reported cases and annual rates calculated using 2001 LFS* data in Kumi

Disease	Reported cases during 16 months	Annual incidence rate per 100000 workers
MSDs of upper extremities	132	63.6(2.5) [†]
Dermatoses	100	48.2
Toxic hepatitis	34	17.9
Asthma	16	7.7
HAVS	5	2.4
Total	287	138.4

*; Labor Force Survey

[†]; estimated annual incidence rate per 100000 workers using 1999 Korea Labor Welfare Corporation and data of Ahn et al 's study(2002)

Table 10. Participation rate by classification of reporter

Occupation of reporter	Expected number	No. of reporters (1 & 2/1st quarter)	Reporting rate	Average report No. per reporter
Occupational physician*	11	9 (8/8)	82%	28
Clinical physician	10	3 (3/3)	30%	1
Nurse of OHS**	11	4 (3/0)	36%	4.5
Nurse of workplace	10	4 (4/3)	40%	3.3
Other	4	1 [†]	25%	
Total	46	21	46%	

*; including resident, [†]; non-medical person

**; OHS, occupational health service

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 2000;12(2):227-34.
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 Baker EL. Sentinel Event Notification System for
 Occupational Risks (SENSOR): the concept. Am
 J Public Health. 1989;79 Suppl:18-20.
 Cherry NM, Meyer JD, Holt DL, McDonald JC.
 Surveillance of work-related diseases by occupa-
 tional physicians in the UK: OPRA 1996-1999.
 Occup Med 2000a ;50(7):496-503

- Cherry NM, Meyer JD, Adishes A, Brooke R, Owen-Smith V, Swales C, Beck MH. Surveillance of occupational skin disease: EPIDERM and OPRA. *Br J Derma* 2000b;142:1128-34.
- Henderson AK, Payne MM, Ossiander E, Evans SG, Kaufman JD. Surveillance of occupational diseases in the United States-A survey of activities and determinants of success. *JOEM* 1998; 40(8):714-9.
- Matte TD, Baker EL, Honchar PA. The Selection and Definition of Targeted Work-related Conditions for Surveillance under SENSOR. *AJPH* 1989;79(supp):21-5.
- Meyer JD, Chen Y, Holt DL, Beck MH, Cherry NM. Occupational contact dermatitis in the UK: a surveillance report from EPIDERM and OPRA. *Occup Med* 2000;50(4):265-73.
- Meyer JD, Holt DL, Cherry NM, McDonald JC. SWORD '98: Surveillance of work-related and Occupational Respiratory Disease in the U.K., *British Journal of Industrial Medicine* 1999; 49(8):485-9.
- Thacker SB, Berkelman RL. Public health surveillance in the United States. *Epidemiol Rev* 1988;10:164-9.

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1.
 - A.
 - B.
 - C.
 - 1.
 2. FEV1 or PEF
 3. (, serial Methacholine Challenge Test)
 - 4.
 - 5.

Definite	A + B + C2 or C3 or C4		
Probable	A + B + C1 or C5		
Possible	A+B	가가	(C2 or C3 or C4)
Suspected		가가	.

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 - B. , ,
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 2. GOT,GPT 2 (w/o OT/PT Ratio <1)
 3. B , ,

Definite	A1 + B1 + B2
Probable	A1 + B2 + B3
Possible	A2 + B1 + B2
Suspected	A2 + B2 + B3

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 - C.
 - D. , , .

Definite	A, B, C, D (D: , , , or NCV)
Probable	A, B, C , D D (-)
Possible	A & B
Suspected	,

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- A. (, , , ,)
- B.
- C.
- D.
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Definite	A, B, C, D
Probable	A, B, C , D D (-)
Possible	A & B, A & C
Suspected	,

5.

- CTS(Carpal Tunnel Syndrome)

- A: , , CTS
- B:
1. (, ,)
 - 2.
- C: ()
- 1)
 - 2)
 - 3)
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Definite	A, B(B1 & B2), C
Probable	A, B(B1 or B2), C
Possible	A B(B1 or B2) C
Suspected	A B(B1 or B2)

- (,)
- A:
- B: , ,
- C: 가

Definite	A, B, C	.	가
Probable	A, B, C	.	
Possible	A, B	C	
Suspected	B	A C	.

6. (, , , , ,)
- A. - IARC: group 2A
 - B. , ,
 - C. , , ,

Definite	A, B, C
Probable	A, B
Possible	B , IARC 가 group 2B
Suspected	B
