Analysis of job-related low back pains in a Korean industrial complex

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Abstract: This paper investigates the job-related low back pains (LBP) in Kuro industrial complex where the manufacturing industries are prevailing. The accident compensation claims during 1992 to 1994 were reviewed and total of 726 LBP related claims were analyzed among 7970 compensation claims. A LBP database was constructed to analyze the back injury profiles of this area. The most frequent cause of LBPs was the manual materials handling related lifting, lowering, carrying, pushing or pulling (45.9%) and the second-most frequent cause was fall and slip (29.8%) and collision (7.9%) was the following cause of LBPs.

(*Keywords:* back injuries, accident statistics, manual materials handling)

1. INTRODUCTION

The job-related low back pains (LBP) become a growing issue of occupational safety and health in Korean industry. However, injury data base on LBPs are not available yet, the causation of LBPs at the workplaces are not well understood.

In order to investigate the causation of LBPs at the workplaces, each accident compensation claim during 1992 to 1994 were reviewed to analyze the causes of LBPs in Kuro industrial complex where the manufacturing industries are prevailing and more than 30 years of operation history.

Usually, the causes of job-related LBPs can be classified as incidental injuries and overexertion injuries. Incidental injuries are largely due to sudden external physical stresses, such as slips and falls, or traffic accidents. On the other hand, overexertion injuries are related to the repeated exertions and bad postures during manual materials handling.

The causes and the diagnoses of LBPs were examined in the compensation claim forms.

The compensation claim forms contain the most accurate and depth information on industrial accidents among all the currently available industrial accident information. Unfortunately all these forms are typed or hand-written documents, we should examine each forms one by one. Based on these examinations, a back injury data base was constructed using Fox

Pro™ to understand the further details on LBPs at the workplaces.

2. LBP PROFILES

The accident statistics of this area are shown as Table 1. Accident rate means that the average number per one hundred workers who had more than four days of absence because of job-related incidents.

Total of 726 LBP claims were identified and analyzed among 7970 compensation claims. The number of LBP claims were about 10% of total accident compensation claims and the amount of LBP compensations (0.8 billion Won in '94,) were 4 - 6 % of total compensations (19.3 billion Won in '94). Average compensation per person was 3.98 million Won in '94 (Table 2. 100 Yen is approximately equivalent to 800 Won).

LBP compensation claims were distributed in manufacturing (58%), construction (21%), transportation (10%), and utility services industries (3%). Considering the number of employees in each industrial sectors, the LBP injury rates were 0.11% in manufacturing, 0.18% in construction, and also 0.18% in transportation industries. This showed that the LBP injury rates were relatively higher in construction or transportation industries.

The job group which showed the most high rate of back injury was skilled-labor (39.8%). The

Table 1. Accident profiles at Kuro industrial complex during '92-'94.

	'92			'93			'94		
	Site	Employee	Accident rate (%)	Site	Employee	Accident rate (%)	Site	Employee	Accident rate (%)
Manufacturing	3,644	133,160	1.42	3,118	111,875	1.33	3,053	125,071	1.04
Construction	655	20,137	3.84	1,296	34,959	1.46	1,059	31,049	1.53
Transportation	132	12,768	0.52	133	12,645	1.35	143	13,039	1.31
Utility	11	396	-	4	299	0.33	4	296	-
etc.	971	30,816	1.43	1,078	33,283	1.06	1,191	44,288	0.84
Total	5,413	197,567	1.58	5,630	193,061	1.31	5,450	213,743	1.08

Table 2. LBP profiles at Kuro industrial complex during '92-'94.

Year	Number of LBP claims	Number of Disability	Medical Compensation (Won)	Salary Compensation (Won)	Disability Compensation (Won)	Total Amount (Won)
'92	265	55	422,336,393	454,978,287	334,354,076	1,121,668,756
'93	273	34	258,420,315	337,798,240	194,250,400	790,468,955
'94	188	37	245,324,902	383,525,720	260,711,880	889,562,582
Total	726	126	927,161,100	1,176,902,297	789,316,356	2,893,379,723

second-ranked job group was simple-labor (27.6%), and the third was driver (7.8%).

The types of injuries were strain/sprain (51%), herniated disc (25%), fracture (15%), and contusion (8%). This result revealed that the prevailing injuries are due to repeated stress rather than acute symptoms.

The most frequent cause of LBPs was the manual materials handling related reasons such as lifting, lowering, carrying, pushing or pulling (45.9%) and the second-most frequent cause was fall and slip (29.8%) and collision (7.9%) was the following cause of LBPs (Figure 1). Also, herniated disc was more frequently found in manufacturing industries (170 cases) compared to other industry sectors (22 cases in construction industries) (Figure 2).

3. CONCLUSIONS

The causation of back injury in Kuro industrial complex was examined and the result was as follows;

1. The back injury rate related to manual materials handling were higher than other locations in Korea appeared in literature [Kee and Chung, 1995]. Previous research examined the Pohang region resulted that 24.3% of LBPs were due to slips and falls and 19.5% was related to lifting. However, Kuro area showed that 45.9% of LBPs were related to manual materials handling.
2. Back strain/sprain and herniated disc injuries are frequently found due to heavy and repeated manual materials handling at the manufacturing industries. Especially, MMH related LBPs were counted similar to the statistics of the US in 1979 [Klein et al, 1979]. This means that the back injury pattern is westernized and ergonomic tools like NIOSH guidelines should be applied at the workplaces.
3. In order to monitor and control the back injuries, statistical feedback is very important. Therefore compensation claim process should be computerized and the injury data base should be prepared for

the better management of back injuries at the workplaces.

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5. REFERENCES

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Figure 1. The causes of back injuries

Figure 2. Distribution of symptoms in each industry