



Work-Related Musculoskeletal Diseases and the Workers' Compensation

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The Industrial Accident Compensation Insurance Act (IACIA) regulates the workers' compensation insurance system and the standards for the recognition of occupational diseases (ODs). Since its establishment in 1994, the IACIA has been amended several times. Before 2008, the approval of compensation for work-related musculoskeletal diseases (WMSDs) was decided based on the recommendation of consultants of the Korea Workers' Compensation and Welfare Service (COMWEL). The IACIA was amended in 2008, and since then, the approval of compensation for occupational injuries has been decided based on the recommendation of COMWEL consultants, whereas the approval of compensation for ODs was decided based on the judgment of Committee on Occupational Diseases Judgment (CODJ) which was established in 2008. According to the 2013 amendment to the IACIA, degenerative musculoskeletal diseases among workers engaged in musculoskeletal-burdening work should be considered compensable ODs. Despite some commendable changes to the workers' compensation insurance system, other significant issues persist. To resolve these issues, related organizations including the associations of orthopedic surgery, neurosurgery, and occupational and environmental medicine; Ministry of Employment and Labor; and COMWEL need to work cooperatively.

Keywords: Work-Related Musculoskeletal Disease (WMSD); Occupational Disease; Workers' Compensation; Korea

INTRODUCTION

In Korea, standards for the recognition of occupational diseases (ODs) were stipulated in the Established Regulations of the Ministry of Labor for the first time when the Ministry of Labor was established in 1981. In 1994, these criteria were removed from the Established Regulations of the Ministry of Labor and included in the Enforcement Rules of the Industrial Accident Compensation Insurance Act (IACIA). Work-related musculoskeletal diseases (WMSDs) were defined in the Enforcement Rules of the IACIA (ER-IACIA) as diseases related to occupations that strain the musculoskeletal system of workers and cause vibration disorders and lower back pain. Standards for recognition of ODs were moved from the ER-IACIA to the Enforcement Decree of the IACI (ED-IACI) Act in 2008, and the definition of WMSDs was also amended the same year.

WMSDs are defined via a Regulation of the Ministry of Employment and Labor. WMSDs are defined as acute or chronic diseases that cause pain or dysfunction due to the accumulation of microtraumas due to work that leads to the excessive loading of muscles, ligaments, tendons, intervertebral discs, cartilages, bones, and the related nerves and blood vessels. In the Regulation, WMSDs are classified into three categories on

the basis of the affected body part such as the upper extremity, lower extremity, or the lower back. WMSDs of the upper extremities refer to diseases of the neck, shoulder, back, arm, elbow, wrist, hand, and fingers, including herniated intervertebral cervical disc, rotator cuff tendonitis, lateral epicondylitis, and carpal tunnel syndrome. WMSDs of the lower extremities refer to diseases of the thigh, knee, leg, ankle and toe, including meniscus injury, patellofemoral pain syndrome, ankle sprain, and plantar fasciitis. WMSDs of the lower back include lower back sprain and herniated lumbar intervertebral discs.

Standards for recognition of ODs were identified in ED-IACIA. When musculoskeletal diseases occur among workers engaged in work that loads the musculoskeletal system, they can be approved as ODs, and the workers can receive compensation. Musculoskeletal-burdening work should include at least one of the following factors: repetition, force, awkward posture, vibration, or other work-related risk factors. Cases wherein musculoskeletal diseases worsen in workers engaged in musculoskeletal-burdening work could be approved for compensation as well. A significant causal relationship is essential for compensation approval. This means that the occurrence or worsening of a disease is influenced by occupational factors rather than non-occupational factors. In cases where it is estimated

that a disease is associated with non-occupational factors rather than occupational factors, workers may not be approved for compensation.

The IACIA was amended, and a new Regulation of the Ministry of Employment and Labor was enacted on June 28, 2013. This paper reviews and discusses the background as well as the contents of the ED-IACIA amendment.

AMENDMENT BACKGROUND

Before 2008, the approval of compensation for ODs or work-related diseases was decided based on the recommendation of consultants of the Korea Workers' Compensation & Welfare Service (COMWEL), a government-affiliated organization responsible for workers' compensation. COMWEL consultants included physicians of internal medicine, orthopedic surgery, neurosurgery, dermatology, otolaryngology, and so on. Mainly, orthopedic surgeons and neurosurgeons recommended the approval or disapproval of compensation for WMSDs. WMSDs are defined in ED-IACIA as diseases related to musculoskeletal-burdening work, vibration disorders, and lower back pain. Diseases related to musculoskeletal-burdening work refer to diseases of muscles, tendons, bones, and joints and the shoulder-arm-neck syndrome among workers engaged in musculoskeletal-burdening work. Vibration disorders refer to the dysfunction of peripheral circulation and sensory or motor dysfunction in workers using local vibration tools. Lower back pain refers to lower back injury as well as acute and chronic lower back pain in workers engaged in manual material handling or musculoskeletal-burdening work.

The compensation approval system before 2008 had several problems. First, COMWEL consultants did not fully understand WMSD mechanisms. When an individual is engaged in a work that loads specific body parts excessively, degenerative changes occur gradually in the related body part, and such long-term degenerative changes can lead to musculoskeletal diseases (1, 2). Therefore, chronic musculoskeletal diseases due to the long-term practice of musculoskeletal-burdening work are degenerative diseases. However, most COMWEL consultants ascribed such degenerative changes to aging rather than the nature of work. Therefore, many WMSDs were not approved for compensation.

Second, the consultants had little knowledge about the nature of work. For deciding the approval or disapproval of compensation for work-related diseases, they should have the knowledge of the causal relationships between diseases and work, and of the diseases themselves. A few consultants understood disease-work relationships, but most consultants, particularly orthopedic surgeons and neurosurgeons, did not fully understand these associations. The occupational and environmental physicians were trained to understand disease-work relation-

ships, but only a few among them were included as COMWEL consultants.

Third, the compensation approval criteria of each COMWEL consultant were different. A few consultants had strict criteria for WMSDs, whereas others had relatively lenient criteria. The criteria differed by region, too. Therefore, there were considerable variations in the approval rates for compensation by consultant and region.

For solving the above mentioned problems, ED-IACIA was amended in 2008. Meaningful changes to the claim approval process were included in the amendment on July 1, 2008. Occupational accidents were divided into accidents on duty and ODs (Table 1). Accidents on duty refer to accidents due to events that occur in the course of working, and ODs refer to diseases that occur gradually over time irrespective of the occurrence of any other event. Approval of compensation for accidents on duty is decided based on the recommendation of COMWEL consultants, whereas approval of compensation for ODs is decided based on the judgment of the Committee on Occupational Diseases Judgment (CODJ), which was established to improve the fairness of the compensation process. The CODJ, which is under COMWEL's framework, was established in six regions in Korea. The committee has one chairperson and six members, including doctors, lawyers, certified labor consultants, and industrial accident professionals. These professionals discuss the causal relationships of compensable ODs and made a decision of the approval or disapproval of compensation. When the committee members disagree among themselves, they vote for compensation approval.

The 2008 amendment to ED-IACIA intended to fix problems in the compensation approval system, but the system was not satisfactorily improved. Many committee members did not sufficiently understand the relationships between WMSDs and work, which was the case with COMWEL consultants. Many degenerative musculoskeletal diseases were not regarded as ODs. Some committee members decided the approval or disapproval of compensation considering only radiologic findings. Besides, the compensation approval criteria were different for different CODJs. Furthermore, many COMWEL consultants did not consider past occupational history in the cases of accidents on duty. This was because occupational accidents were divided into accidents on duty and ODs.

As can be inferred from Table 2, among all approved ODs, the trends of work-related musculoskeletal diseases increased before 2008 and decreased after 2008 (3, 4). The WMSD approval rates were relatively high in some CODJs, whereas those of other CODJs were low. As summarized in Table 3, the WMSD approval rate was 55.3% and 57.5% in 2007 and 2008, respectively, but it decreased rapidly after 2008 and was only 47.7% in 2010 (5). Despite the 2008 amendment to ED-IACIA, controversies surrounding the compensation for WMSDs, such as the

Table 1. Enforcement Decree of the Industrial Accident Compensation Insurance Act amended in 2008

Article 37 (Standards for Recognition of Occupational Accidents)

- (1) If a worker suffers any injury, disease, or disability or dies due to any of the following causes, it shall be deemed an occupational accident: Provided that this shall not apply where there is no proximate causal relationship between his/her duties and the accident:
1. Accident on duty:
 - (a) Any accident that occurs while he/she performs a duty under his/her employment contract or other acts incidental thereto;
 - (b) Any accident that occurs while he/she uses a facility, etc., provided by his/her employer, due to any defect in or any careless management of such facility, etc.;
 - (c) Any accident that occurs while he/she commutes to or from work using a transportation means provided by the employer concerned or other similar means under the control and management of his/her employer;
 - (d) Any accident that occurs while he/she participates in an event sponsored by or under the direction of his/her employer or prepares for such event;
 - (e) Any accident that occurs at recess due to an act deemed to be under the control and management of his/her employer; or
 - (f) Any other accident that occurs in connection with his/her duties.
 2. Occupational disease:
 - (a) Any disease caused by handling or being exposed to any physical agent, chemical substance, dust, pathogen, work imposing a burden on his/her body, or any other agent causing trouble to his/her health while performing his/her duties;
 - (b) Any disease caused by an occupational injury; or
 - (c) Any other disease caused in connection with his/her duties.
 - (2) No injury, disease, disability, or death of a worker due to his/her intentional action, self-harm, or other criminal act, or caused by such act shall be deemed an occupational accident: Provided that when the injury, disease, disability, or death is caused by any act committed in the state of a marked decline in his/her normal cognitive function, etc., as prescribed by Presidential Decree, it shall be deemed an occupational accident.
 - (3) The detailed standards for the recognition of occupational accidents shall be prescribed by Presidential Decree.

Article 38 (Occupational Disease Review Commission)

- (1) In order to deliberate on the recognition of an occupational disease pursuant to Article 37 (1) 2, there shall be established an Occupational Disease Review Commission (hereinafter referred to as the "Review Commission") in an agency belonging to the Service.
- (2) Diseases excluded from deliberation by the Review Commission and the deliberation procedures by the Review Commission shall be prescribed by ordinance of the Ministry of Employment and Labor.
- (3) Matters necessary for the organization and operation of the Review Commission shall be prescribed by ordinance of the Ministry of Employment and Labor.

Table 2. Trends of work-related musculoskeletal diseases in 2006–2011

| Diseases | Numbers by year | | | | | |
|--------------------------------|-----------------|--------|-------|-------|-------|-------|
| | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
| Occupational disease | | | | | | |
| Musculoskeletal disease | 10,235 | 11,472 | 9,734 | 8,721 | 7,803 | 7,247 |
| Musculoskeletal-burdening work | 6,233 | 7,723 | 6,733 | 6,234 | 5,502 | 5,077 |
| Non-accidental lower back pain | 1,615 | 1,390 | 1,471 | 1,343 | 1,292 | 1,161 |
| Accidental lower back pain | 1,006 | 564 | 1,831 | 2,407 | 2,288 | 1,168 |
| Carpal tunnel syndrome | 3,612 | 5,769 | 3,401 | 2,472 | 1,720 | 2,556 |
| | | | 30 | 12 | 202 | 192 |

Table 3. Trends of claim and approval for occupational diseases in 2007-2010

| Diseases | Numbers by year | | | |
|--------------------------------|-----------------|-------|--------|--------|
| | 2007 | 2008 | 2009 | 2010 |
| Musculoskeletal diseases | | | | |
| Claim | 3,485 | 3,885 | 5,853 | 6,163 |
| Approval | 1,928 | 2,235 | 3,143 | 2,942 |
| Approval rate (%) | 55.3 | 57.5 | 53.7 | 47.7 |
| Cerebrocardiovascular diseases | | | | |
| Claim | 3,236 | 3,103 | 2,909 | 2,780 |
| Approval | 1,302 | 998 | 454 | 401 |
| Approval rate (%) | 40.2 | 32.2 | 15.6 | 14.4 |
| Other work-related diseases | | | | |
| Claim | 1,518 | 1,414 | 1,271 | 1,436 |
| Approval | 512 | 425 | 347 | 403 |
| Approval rate (%) | 33.7 | 30.1 | 27.3 | 28.1 |
| Total | | | | |
| Claim | 8,239 | 8,402 | 10,033 | 10,379 |
| Approval | 3,742 | 3,658 | 3,944 | 3,746 |
| Approval rate (%) | 45.4 | 43.5 | 39.3 | 36.1 |

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scope of degenerative WMSDs and inequality of the criteria for occupational WMSDs among CODJ members, persisted. Therefore, the workers' organization demanded an improvement of the compensation system. Government departments, employers, and employees discussed with experts ways to solve the problems associated with the compensation system. Consequently, the IACIA was amended again on June 28, 2013.

AMENDMENT OF ENFORCEMENT DECREE OF INDUSTRIAL ACCIDENT COMPENSATION INSURANCE ACT ON JUNE 28, 2013

The Schedule 3 of ED-IACIA regulated the specific criteria for recognition of OD, and the following sentence was added via the amendment in 2013: "If it is proved medically that the course of change from aging in the musculoskeletal disease was aggravated rapidly due to musculoskeletal-burdening work, it shall be deemed an occupational disease" (Table 4). This means that

Table 4. Criteria for work-related musculoskeletal diseases in the Schedule 3 of Enforcement Decree of the Industrial Accident Compensation Insurance Act amended in 2013

1. If a musculoskeletal disease occurred or was aggravated in the arm, leg, or back of a worker who engaged with musculoskeletal-burdening work including one of the following types of work, it shall be deemed an occupational disease, provided that this shall not apply where there is no proximate causal relationship between his/her duties and the accident:
 - (1) work requiring frequent repetitions;
 - (2) work requiring excessive forces;
 - (3) work requiring awkward postures;
 - (4) work requiring vibrations; or
 - (5) other work requiring burdens of specific body parts.
2. If it is proved medically that a pre-existing disease was aggravated due to work, it shall be deemed an occupational disease.
3. If it is proved medically that the course of change from aging in the musculoskeletal disease was aggravated rapidly due to musculoskeletal-burdening work, it shall be deemed an occupational disease.
4. If the musculoskeletal disease occurred due to sudden forces during musculoskeletal-burdening work, it shall be deemed an occupational disease.
5. The scope of musculoskeletal diseases, standards for musculoskeletal-burdening work, and others for the recognition of occupational musculoskeletal disease shall be prescribed by Regulation of Ministry of Employment and Labor.

degenerative musculoskeletal diseases related with work could be considered compensable ODs. A new Regulation of the Ministry of Employment and Labor was established via this amendment; it is called "Details required to decide approval of cerebrovascular or cardiovascular diseases and musculoskeletal diseases." This Regulation includes the definition, categories, and methods of the work-relatedness of WMSDs. According to this Regulation, when a worker engaged in musculoskeletal-burdening work suffers from a musculoskeletal disease due to an accident on duty, the OD compensation process should be applied and the worker's occupational history should be considered when deciding the approval or disapproval of compensation. The Regulation stipulates that the degree of musculoskeletal-burdening work, occupational history, duration of work, past medical history, and other factors should be considered when deciding the approval or disapproval of compensation. The degree of musculoskeletal-burdening work should be decided by an ergonomist, occupational hygienist, and an occupational and environmental physician.

DISCUSSION

The main change in the 2013 amendment of ED-IACIA is that the rapidly aggravated musculoskeletal disease due to musculoskeletal-burdening work must be considered OD. Therefore, degenerative musculoskeletal disease in workers engaged in long-term musculoskeletal-burdening work could be approved as an OD, and the workers could receive compensation. According to the amended ED-IACIA, COMWEL consultants should consider occupational history when evaluating cases of accident on duty among workers engaged in musculoskeletal-burdening work; furthermore, such cases should be transferred to CODJ, if needed, for the evaluation of work-relatedness and the compensation approval.

In the early days after the 2008 amendment of ED-IACIA, a degenerative change in the musculoskeletal system was considered to be aging, and degenerative musculoskeletal disease

was hardly approved as an OD (6). In the CODJ, some members suggested that the degenerative change was due to both the physical activity at work and aging, and this led to the degenerative musculoskeletal disease as an OD. The 2013 amendment of ED-IACIA was commendable but insufficient to resolve the issues associated with the compensation system. There are unsolved problems in the compensation system despite the 2008 and 2013 amendments to ED-IACIA.

The understanding of work-relatedness among COMWEL consultants and among the committee members improved compared with that in the past, but the degree of understanding of many consultants and members remains insufficient. The main concerns of orthopedic surgeons and neurosurgeons are not the evaluation of the work-relatedness of the diseases but the diagnosis and care of patients. Consequently, it is not easy to improve their understanding of work-relatedness. Therefore, the Ministry of Employment and Labor and COMWEL should consider methods of improving the consultants and CODJ members' understanding of work-relatedness, for example, via a periodic symposium about the work-relatedness of compensable ODs.

Standards for recognition of ODs are regulated in ED-IACIA. These standards are inadequate for deciding the approval or disapproval of compensation in many WMSD cases, and it would be practically impossible to define clear criteria for determining work-relatedness. Hence, social consensus and scientific evidence are needed for deciding the approval or disapproval of compensation (7, 8). However, social consensus on the compensation system for WMSDs is not sufficient on its own. Previously, individual consultants and CODJ members applied different criteria for approving compensation. Some consultants or members employed strict criteria for WMSDs, whereas others employed relatively lenient criteria. There were differences in the criteria applied by orthopedic surgeons, neurosurgeons, and occupational and environmental physicians. The associations of orthopedic surgery, neurosurgery, and occupational and environmental medicine; Ministry of Employment and La-

bor; and COMWEL should cooperate to narrow the differences in the criteria for the approval of compensation in the cases of WMSDs.

In the 2008 amendment to ED-IACIA, occupational accidents were sub-classified into accidents on duty and ODs. The evaluation of work-relatedness for both accidents on duty and ODs was carried out by COMWEL, but different processes for the approval of compensation were applied for accidents on duty and ODs. In the case of accidents on duty, the approval of compensation was decided based on the recommendation of COMWEL consultants. In the case of ODs, the approval was decided based on the judgment of the CODJ. Most WMSDs progress gradually, but the onset of symptoms is usually perceived suddenly usually due to an injury as opposed to gradually (9, 10). Hence, a worker who experiences an event during work usually claims compensation under accidents on duty, but the worker's WMSD may not be approved for compensation in many cases. The worker whose diseases had not been approved for compensation should apply a new claim again for compensation for ODs. The approval system that divided occupational accidents into accidents on duty and ODs was deemed unreasonable and inconvenient to workers. After the 2013 amendment to ED-IACIA, the consultants are required to consider occupational history in the cases of accidents on duty, if necessary. The compensation approval process was improved through 2013 amendment to ED-IACIA, but further improvements to ED-IACIA are still required.

The compensation approval system contains another significant unsolved issue. When evaluating WMSDs cases, COMWEL consultants and CODJ members should consider the worker's occupational history and known work-related factors including physical demand of the work and workplace risk factors, such as repetition, force, posture and vibration, duration of work, work hours, and tools used for working (11, 12). According to COMWEL's guideline for WMSD assessment, a field investigation is recommended for evaluating musculoskeletal-burdening work and gathering the information required for assessing work-relatedness. The field investigation is conducted by COMWEL staff, with or without an occupational and environmental physician, an occupational hygienist, and an ergonomist. However, in many cases, field investigations were not carried out because of the lack of workforce. Appropriate field investigations were carried out in about one-third to less than half of all cases. In half or more of the WMSD cases, there was insufficient information for compensation approval because the corresponding field investigation was not performed. This issue is very important and cannot be solved until the structural and organizational issues of COMWEL are mitigated. In addition, ergonomists should be involved in the field investigation, and an occupational and environmental physician should evaluate the field investigation and work-relatedness.

SUMMARY

In Korea, Standards for recognition of ODs were stipulated in the Established Regulations of the Ministry of Labor for the first time when this ministry was established in 1981, and these standards have been amended substantially since then. Before 2008, COMWEL consultants approved compensation for WMSDs. ED-IACIA was amended in 2008 to stipulate that the approval or disapproval of compensation for accidents on duty be decided based on the recommendation of COMWEL consultants, whereas that of compensation for ODs be decided based on the judgment of the CODJ, which was established in 2008. According to the 2013 amendment to ED-IACIA, degenerative musculoskeletal diseases among workers engaged in long-term musculoskeletal-burdening work should be considered compensable ODs.

The compensation approval system of ED-IACIA has been amended. Despite some commendable changes, other significant systemic issues persist. In order to solve these issues and improve the compensation approval system, the related organizations including the associations of orthopedic surgery, neurosurgery, and occupational and environmental medicine; Ministry of Employment and Labor; and COMWEL should cooperate.

DISCLOSURE

The authors declare that they have no conflicts of interest to disclose.

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