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A red-eyed welder a case report

Abstract

Welding is a process of joining metals using pressure and/or heat, often with the addition of filler materials. During welding, metal and gas fumes are released, which can cause various health hazards affecting multiple organ systems.

We present the case of a 32-year-old welder who complained of eye redness. A detailed occupational history, including work environment and hazards, was obtained. The patient underwent eye examination, audiometry, and additional tests. The diagnosis was work-related allergic conjunctivitis and noise-induced hearing loss.

This case highlights the importance of thorough occupational history taking and awareness of workplace hazards. We also discuss common health risks associated with welding and preventive measures.

Keywords: Welding, occupational history, workplace hazards

INTRODUCTION

Welding, joining, and coating of metallic materials are among the most commonly used manufacturing processes in modern metallurgy. Welding involves joining metals by applying pressure and/or heat, often with the use of filler materials when necessary (1). Common welding techniques include Manual Metal Arc welding, Metal Inert Gas welding, Tungsten Inert Gas welding, Gas welding, and Shielded Arc welding. During the welding process, depending on the technique used, heat as well as ionizing and non-ionizing radiation are generated (2).

Many substances in welding fumes, including metals, metal surface coatings, paints, and welding gases, are harmful to health (3). During welding, metals overheat and condense, oxidizing and releasing vapors. These metals include zinc, iron, cadmium, manganese, chromium, nickel, aluminum, and lead (4–6). Gas welding produces gases such as argon, helium, carbon dioxide, and their mixtures (7). Welding fumes, dust, and gases may cause respiratory and systemic effects in welders. Additionally, radiation exposure can cause eye and skin damage.

Musculoskeletal disorders due to ergonomic risks and hearing loss from welding machine noise may also develop.

A thorough work history and occupational background should be obtained from every patient presenting to outpatient clinics. Our patient was admitted to the ophthalmology clinic with eye redness and, upon learning he was a welder, was referred to the occupational diseases clinic. Prior to presenting this case, informed consent was obtained from the patient.

CASE REPORT

A 32-year-old male patient presented to the occupational diseases clinic with complaints of eye redness, pain, and blurred vision lasting for the past 2 months (Figure 1). He occasionally experienced shortness of breath during intense welding, which resolved upon leaving the work area. He also reported intermittent facial rash, sometimes occurring at work, over the last 2 months. Audiometry performed during periodic examinations revealed high-frequency hearing loss. The patient has a 5-pack-year smoking history but denies alcohol or substance use. His past medical history is notable for a work-related right

thumb fracture, which fully healed. He has no history of surgery, chronic medication use, or chronic illnesses.

The patient has been performing gas welding for the past 5 years, during which he was exposed to workplace noise. A detailed occupational history was obtained. He previously operated a forklift for parts distribution in the automotive industry for 2.5 months and worked in automotive upholstery for 11 months. Additionally, he was employed in the construction industry for 4 years, focusing on ground reinforcement.

On physical examination, the eyes were noted to be hyperemic, while the skin appeared normal on inspection. Ophthalmologic evaluation revealed perfect vision with glasses; both anterior and posterior segments were normal. The patient exhibited a mild papillary reaction, and the cornea was transparent. Other system examinations were unremarkable.



Figure 1. Eye inspection

On physical examination, the eyes were noted to be hyperemic, while the skin appeared normal on inspection. Ophthalmologic evaluation revealed perfect vision with glasses; both anterior and posterior segments were normal. The patient exhibited a mild papillary reaction, and the cornea was transparent. Other system examinations were unremarkable.

Laboratory tests including blood count, liver and kidney function tests, and urinalysis were within normal limits. Pulmonary function tests (Figure 2) and posterior-anterior chest X-ray (Figure 3) were unremarkable.

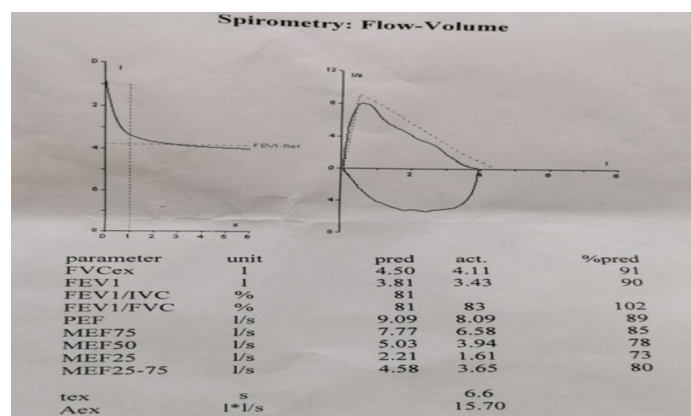


Figure 2. Respiratory Function Test



Figure 3. Posterior Anterior Lung Radiograph

Audiometry (Figure 4) demonstrated high-frequency hearing loss at 4000 Hz.

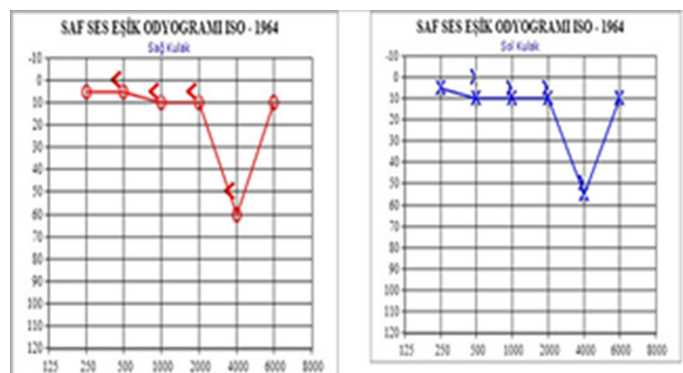


Figure 4. Audiometry Test

In this case, bilateral high-frequency hearing loss at 4000 Hz was attributed to noise exposure and considered an occupational disease. Additionally, allergic conjunctivitis was diagnosed as an occupational condition related to welding work.

The individual had already left the workplace and treatment was arranged by an ophthalmologist.

Informed Consent

Written informed consent was obtained from the patient.

DISCUSSION

The high heat generated during the welding process causes metal oxides, metal contamination, surface contaminants, and various gases to be released into the work environment (3,8). Air pollution in the welding area is influenced by whether the workspace is

open or enclosed and by the effectiveness of ventilation (3). Welding is associated with numerous health hazards.

Upper respiratory tract irritation, cough, pulmonary edema, metal fume fever (MFF), asthma, chronic obstructive pulmonary disease (COPD), chronic hypersensitivity pneumonitis, pneumoconioses, lung and pleura cancers can be seen in welders due to welding fumes, dust and gases. A case of MFF due to inhalation of zinc oxide fumes using an arc welder was reported (9). In another case, aluminum in a manual metal arc welder was reported to cause asthma symptoms (10). Siderosis may develop due to the accumulation of iron particles in alveolar macrophages and interstitium due to chronic welding fume inhalation. A case of a steel welding worker developed pneumosiderosis due to his work is presented. A case of a steel welding worker who developed pneumosiderosis due to his work is presented. Lung cancer may develop due to the chromium and nickel fumes found in welding smoke (2,7,11,12).

Metals found in welding fumes can cause systemic effects; for example, cadmium exposure may lead to renal failure. A welder was reported to have developed kidney failure due to exposure to cadmium and lead at work. (13).

During welding, both ionizing radiation (X-rays) and non-ionizing radiation (ultraviolet, visible, and infrared rays) are emitted (7,14). Corneal damage and cataracts may occur due to infrared radiation (15).

Ultraviolet rays can cause photokeratitis (7). Permanent visual impairment may develop due to chronic retinal damage (16). Cataract, cornea and iris damage, macular degeneration, retinal detachment and allergic conjunctivitis may occur (17). A case of photic maculopathy developing in an arc welder after exposure to bright electric arc light was reported (18).

Burns may occur on the skin due to chemical reactions caused by ultraviolet rays and heat. A case of bullous dermatosis due to PVC welding fumes was presented (19).

Noise-induced hearing loss may be observed in welder workers (20). Due to the conditions of execution of the work Musculoskeletal disorders can be seen in welders in the cervical, back, lumbar, wrist and hands (21).

CONCLUSION

The welding profession involves many health hazards. It can cause damage to more than one system in humans. A detailed anamnesis should be taken. The factors he is exposed to at work should be questioned in detail. Detailed evaluation of the workplace and work history is of great importance. Health hazards to employees can be prevented by taking adequate and necessary precautions in the workplace.

Engineering control, work practices, and administrative controls are essential processes for reducing exposure to welding-related occupational hazards. Appropriate personal protective equipment (PPE) should be used. There should be general and local

ventilation systems to prevent the spread of air pollutants. Eyes must be protected against all types of radiation and heat. Face and eye protective welding masks should be used. If adequate precautions are not taken, occupational diseases will continue to occur in welding workers.

In this story, we wanted to show that it is important to take a detailed occupational history, evaluate exposures by taking a good anamnesis, and that all systems can be affected by a job, and to draw attention to the fact that taking a detailed anamnesis is very important. Taking a comprehensive anamnesis is crucial for accurate diagnosis and management .

Conflict of Interests

The authors declare that there is no conflict of interest in the study.

Financial Disclosure

The authors declare that they have received no financial support for the study.

Patient Informed Consent

Written informed consent was obtained from the patient.

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