Tingkat radiasi sinar Ultraviolet dan beberapa faktor yang berhubungan dengan keluhan mata "welder's flash" pekerja las industri kecil Pulogadung Jakarta Timur

Warouw, Sonny Priajaya, author

Abstrak

ABSTRAK

Proses pengelasan merupakan salah satu sumber sinar UV buatan manusia Pemaparan radiasi sinar UV pada pekerja las bila tidak dikendalikan/dibatasi dapat menimbulkan efek kesehatan yang merugikan. Akibat dari sinar UV antara lain terhadap mata, yang dapat menyebabkan peradangan selaput mata, selaput bening, dan peradangan kelopak mata, biasa disebut "welder's flash" atau "arc eye".

Tujuan penelitian ini adalah untuk mengetahui tingkat radiasi sinar UV dan beberapa faktor yang berhubungan dengan keluhan mata "welder's flash". Faktor faktor yang diteliti adalah tingkat radiasi efektif alat las, lingkungan kerja, lama pemaparan, dan pemakaian alat pelindung diri.

Penelitian ini bersifat deskriptif analitik dengan pendekafan Crossectional, yang dilakukan terhadap 98 pekerja las dari 2 sentry industri kecil yaitu Perkampungan Industri Kecil (PIK) dan Santa. Usaha/ndustri Kecil (MK) Pulogadung Jaktim.

Dari hasil penelitian diketahui tingkat radiasi efektif berkisar antara 120 - 4580 μW/cm2 . Tingkat radiasi terbanyak antara 300-3000 μW/cm2 , yang berdasarkan NAB ACGIH exposure level hanya boleh 1-10 detik tanpa alat pelindung diri. Prevalensi keluhan mata welder's flash (tiga bulan terakhir) adalah 62,2%. Dengan jumlah keluhan berkisar 1 sampai 3 kali.

Jenis proses las terbukti berhubungan dengan tingkat radiasi efektif (p<0,05). Kuat arcs (amper) berhubungan dengan tingkat radiasi efektif dengan pola hubungan linier positif (r=0,44, R2=0,21, p<0,05). Diameter kawat las berhubungan dengan tingkat radiasi dengan pola hubungan linier positif (r=0,53, R2 =0,27, p<0,05). Lokasi kerja (indoor,outdoor) terbukti berhubungan dengan tingkat radiasi efektif (F=7,25, p<0,05). Cat dinding tidak terbukti berhubungan dengan radiasi efektif (P=0,61, p> 0,05). Jarak dinding dengan alat las tidak terbukti berhubungan dengan radiasi efektif (t=-0,75,p>0,05). Tingkat radiasi efektif berhubungan dengan keluhan mata (X2=11,54 p<0,05). Pemakaian APD tidak baik ada 40,8%. Pemakaian APD terbukti berhubungan dengan keluhan mata (X2=4,80,p<0,25). Lama pemaparan berkisar antara 90-400 menit perhari dan terbukti berhubungan dengan keluhan mata (X2=1,92, p< 0,25).

Model regresi linier ganda radiasi efektif sbb : Y = 246,87-2,94(amper)-293,47(kawat)+560, 66(proses)+77,62(lokasi kerj a)+12,52(amperxpros)+5,56(amperx kawat), 0,-47,93, R2=0,86, Re .= 0,85). Model regresi logistic keluhan mata sbb : Logit p(x) = -1,9647+2,21(T_RAD)+1,16(APD)+0,46(L EXPOS) dengan (X2= 18,09, p< 0,05). Nilai Odds Ratio (95% Confident Interval) tingkat radiasi = 9,1 (2,16-38,32), pemakaian APD = 3,2(1,20-8,51), lama pemaparan =1,6 (0,59-18,98).

Melihat keadaan tersebut di atas, maka perlu diadakan upaya pelayanan kesehatan dan keselamatan kerja, serta perlu upaya pengawasan dan pembinaan K3 di industri kecil las.

<hr>ABSTRACT

Welding process is a source of UV radiation created by human made. Exposure to UV radiation from the welding arc can result a serious health problems to the welder, and impact of UV ray on the eyes is inflammatory of conjungtivita, cornea and eyelid, also known as "welder's flash" or "arc eye".

The objectives of this research were to identify the level of UV radiation and several factors related welder's flash eye complaints. Several factors in research of this study were the level of effective irradiance (eflr), welding process, the current levels used (ampere), welding rod diameters, working station, length of exposures, and the use of personal protective equipment (PPE). The research was descriptive analysis with crossectional approach, which was conducted to 98 welders in 2 centers of small scale welding industry called Perkampuagan Industri Kecil (PIK) and Sentra Usaha Industri Kecil (SUM) Pulogadung Jakarta Timur.

The results of this research showed that the level of effective irradiance were arround 120 - 4580 µW/cm2. Mostly the level of ef.irr were between 300 -3000 µW/crn2, based on TLV ACGH exposure level allow only 1-10 second without PPE.

The prevalence of welder's flash eye complaints (for late 3 month) was 62,2% with amount of frequency around 1 - 3 times.

There was significant association between the type of welding process and the level of effective irradiance (p<0,05). The current levels used (ampere) was proved significant association with the eff.lrr, by the type of relation was liner positive (r 0,44, R2=0.36,pcz0.05), and also was Welding rod diameters with efIR, by the type of relation was linier positive (r 0.53,R2=0,27,p<0.05). Places of working station (indoor/semi, outdoors) were proved significant association with level of efIrr (F=7.25,p<0.05). There was no significant association between wall painting and e£Irr. (F=0.61,p?0.05), and also no significant association between distance of wall and welding equipment with e£Lr. (t=0.75,p>0.05). From 98 of welders , there were 40.8% bad uses for PPE. Using PPE was proved significant association with the welder's flash eye complaints (X2=4.80,p<0.25)_ Length of exposure were between 90-400 minutes per days and it's proved significant association with welder's flash eye complaints.(X2=2.14,p<0.25).

Using multiple linear regression analysis, the fit model of eflrr prediction was Y=246.87-2.94(amp er)-93.47(kawat)+5 60.66(proses)+77.62(lokasi kerj a)+12.5 2 (amperxproses)+5.56(amperxkawat), (r'193,R2=0.86, Ra=0.85). Using multiple logistic regression, the fit model of welder's flash eye complaints prediction was ' : Logit p(x) = -1.9647+2.21(level of e£Tr) +1.16(PPE) + 0.46(length of exposure) with (X2=18.09, p<0.05). Value of Odds Ratio(95% Confident Interval) level of efective irradiance = 9.1(2.16-38.32), using PPE = 3.2(1.20-8.51), length of exposure = 1.6(0.59-18.98).

By looking for the reasons above, it is important to conduct the occupational health services, and necessary to control and establish safety practices in welding small scale industry.