Abstract

Occupational exposures in different industries may pose serious health impacts. A number of epidemiological studies have focused on the association of occupational exposures and adverse health effects. The need of the hour is to focus on the reproductive health of workers engaged at different jobs in varied industries. Increasing environmental as well as occupational exposures have led to serious effects on the reproductive health of workers and have also endangered the life of future generations.

The present paper highlights the impact of occupational exposures on iron industry workers. Future health based researches are recommended so as to assess the impact of occupational exposures on reproductive capabilities of workers.

Thus toxic metals have been found to be causative agents in infertility among different populations [14–17]. Semen quality is a parameter which also affects the reproduction. Semen quality has been extensively investigated among the welders by different researchers [18–24]. Semen quality of 57 workers from a welding plant and 57 controls was monitored and sperm concentrations of exposed workers were found to be $14.5\pm24.0$ million/ml as compared to control group ($62.8\pm43.7$ million/ml). Rapid linear sperm motility was found to be decreased in exposed workers as compared to controls and a significant positive correlation between the percentage of sperm tail defects and blood nickel concentration in exposed workers. On the other hand, sperm concentration showed a negative correlation with blood chromium content in workers [18]. Similarly, low-level exposure to hexavalent chromium associated with TIG stainless steel and mild steel welding was not found to be a major hazard for human spermatogenesis [21]. Chromium-induced reproductive toxicity was suggested to be through oxidative stress. In another study, the distribution and temporal variability of power-frequency magnetic field exposure in men, and the correlation of exposures within couples using data from a longitudinal study of 25 men and their female partners recruited from an infertility clinic was conducted. The average and 90th percentile demonstrated fair to good reproducibility, whereas the maximum poor reproducibility was shown over repeated sampling days, each separated by a median of 4.6 weeks [9].
Conclusion

Iron industry is employing a huge number of workers to meet its requirements. Workers of these industries are exposed to different sets of chemicals and physical factors after which they may suffer from various reproductive health ailments. Studies reveal a substantial decrease in the sperm count among exposed workers (14.5±24.0 million/ml) as compared to control group (62.8±63.7 million/ml). As a precautionary measure, workers should be provided proper protection equipments so as to minimize the exposure during different industrial processes. Workers should also be checked regularly for their different health parameters including reproductive health.

References

1. Singh Z, Chadha P (2014) DNA Damage Due to Inhalation of Complex Metal Particulates among Foundry Workers. Adv Env Biol 8: 225-230. Link: https://bit.ly/2awyZyP
2. Singh Z, Chadha P, Sharma S (2016) Lung Health among Welders. American J Env Occu Health 1: 6-10. Link: https://bit.ly/2WlIuM
3. Singh Z, Chadha P (2012) Health Concerns in Welding Industry. Int J Enh Res Sci Tech Eng 2: 1-5. Link: https://bit.ly/2WkJdoG
4. Singh Z, Chadha P (2013) Oxidative Stress Assessment among Iron Industry Grinders. Biochem Cell Arch 13: 65-68. Link: https://bit.ly/2kXyJnJ
5. Singh Z, Chadha P (2016) Assessment of DNA Damage as an Index of Genetic Toxicity in Welding Micro-environments among Iron Based Industries. Tox Ind Health 32: 1817-1824. Link: https://bit.ly/2WXJW1b
6. Chia SE, Lim ST, Tay SK, Lim ST (2000) Factors associated with male infertility: a case-control study of 218 infertile and 240 fertile men. BJOG 107: 55-61. Link: https://bit.ly/2WwPu3
7. Chia SE, Tay SK (2001) Occupational risk for male infertility: a case-control study of 218 infertile and 227 fertile men. J Occup Environ Med 43: 946-951. Link: https://bit.ly/348FQCoR
8. Claman P (2004) Men at risk: occupation and male infertility. Fertil Steril 81: 19-26. Link: https://bit.ly/2U5MzW
9. Lewis RC, Hauser R, Maynard AD, Neitzel RL, Wang L, et al. (2016) Personal measures of power frequency magnetic field exposure among men from an infertility clinic: distribution, temporal variability and correlation with their female partner’s exposure. Radiat Prot Dosimetry 172: 401-408. Link: https://bit.ly/38WjQwz
10. Melgarejo M, Mendiola J, Koch HM, Monino-Garcia M, Noguera-Velasco JA, et al. (2015) Associations between urinary organophosphate pesticide metabolite levels and reproduction parameters in men from an infertility clinic. Environ Res 137: 292-298. Link: https://bit.ly/38WjQUl
11. Tsujimura A, Matsumiya K, Takahashi T, Yamanaka M, Koga M, et al. (2004) Effect of lifestyle factors on infertility in men. Arch Androl 50: 15-17. Link: https://bit.ly/33m9NC
12. Zafar A, Espani SA, Bostan N, Cincinelli A, Tahir F, et al. (2015) Toxic metals signature in the human seminal plasma of Pakistani population and their potential role in male infertility. Environ Geochem Health 37: 515-527. Link: https://bit.ly/2TYqapX
13. Tanrikut E, Karaer A, Celik O, Celik E, Oltu B, et al. (2014) Role of endometrial concentrations of heavy metals (cadmium, lead, mercury and arsenic) in the aetiology of unexplained infertility. Eur J Obstet Gynecol Reprod Biol 179: 187-190. Link: https://bit.ly/2QDFqDr
14. Inhorn MC, King L, Nriagu JO, Kobeissi L, Hammond N, et al. (2008) Occupational and environmental exposures to heavy metals: risk factors for male infertility in Lebanon? Reprod Toxicol 25: 203-212. Link: https://bit.ly/390WFsz
15. Podzimek S, Prochazkova J, Pribylova L, Bartova J, Ulcova-Gallova Z, et al. (2003) Effect of heavy metals on immune reactions in patients with infertility. Cas Lek Cesk 142: 285-288. Link: https://bit.ly/391oBMe
16. Nivsarkar M, Cherian B, Patel S (1998) A regulatory role of sulfhydryl groups in modulation of sperm membrane conformation by heavy metals: sulfhydryl groups as markers for infertility assessment. Biochem Biophys Res Commun 247: 716-718. Link: https://bit.ly/2QzZ2OF
17. Bonde JP (1993) The risk of male subfecundity attributable to welding of metals. Studies of semen quality, infertility, fertility, adverse pregnancy outcome and childhood malignancy. Int J Androl 16: 1-29. Link: https://bit.ly/2Qz2CRo
18. Danadive K, Rozati R, Reddy GP, Grover P (2003) Semen quality of Indian welders occupationally exposed to nickel and chromium. Reprod Toxicol 17: 451-456. Link: https://bit.ly/2ZzCRO
19. Kumar S, Zaidi SS, Gautam AK, Dave LM, Saiedy PN (2003) Semen quality and reproductive hormones among welders - A preliminary study. Environ Health Prev Med 8: 64-67. Link: https://bit.ly/33pDfAg
20. Raymond LW (1993) Semen quality in welders exposed to radiant heat. Br J Ind Med 50: 1055-1056. Link: https://bit.ly/33iJAYU
21. Bonde JP, Ernst E (1992) Sex hormones and semen quality in welders exposed to hexavalent chromium. Hum Exp Toxicol 11: 259-263. Link: https://bit.ly/2UeAlUzv
22. Bonde JP (1992) Semen quality in welders exposed to radiant heat. Br J Ind Med 49: 5-10. Link: https://bit.ly/2TXZGty
23. Bonde JP (1990) Semen quality in welders before and after three weeks of non-exposure. Br J Ind Med 47: 515-518. Link: https://bit.ly/2IYBQ7b
24. Bonde JP (1990) Semen quality and sex hormones among mild steel and stainless steel welders: a cross sectional study. Br J Ind Med 47: 508-514. Link: https://bit.ly/39ZpC2B

Discover a bigger Impact and Visibility of your article with Peertechz Publications

Highlights
- Signatory publisher of ORCID
- Signatory Publisher of DORA (San Francisco Declaration on Research Assessment)
- Articles archived in world’s renowned service providers such as Portico, CNKI, AGRIS, TDKNet, Base (Bielefeld University Library), CrossRef, Scilit, J-Gate etc.
- Journals indexed in ICMJE, SHERPA/ROMEO, Google Scholar etc.
- OAI-PMH (Open Archives Initiative Protocol for Metadata Harvesting)
- Dedicated Editorial Board for every journal
- Accurate and rapid peer-review process
- Increased citations of published articles through promotions
- Reduced timeline for article publication

Submit your articles and experience a new surge in publication services (https://www.peertechz.com/submission).

Peertechz journals wishes everlasting success in your every endeavours.

Copyright: © 2020 Singh Z. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Citation: Singh Z (2020) Infertility among iron industry workers. Adv Toxicol Toxic Effects 4(1): 009-010. DOI: https://dx.doi.org/10.17352/atte.000008