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Introduction

Activated Carbon Fabric (ACF) is a new and porous adsorbent, which has been obtained from an appropriate porous precursor by an adequate carbonization and activation process. Among various

they are made up of cotton material, and snugly cover the mouth and nose, thereby providing comfort and effectiveness.

6 months before providing the masks, the blood lead level was determined for these workers from the National Referral Centre for Lead Poisoning in India (NRCLPI), Bangalore. This indigenous mask (referred as M1 in this study) was given to these workers and their blood was sent to NRCLPI, Bangalore, in heparinized vacutainers. Workers continued to work in the same place while using the masks.

They were instructed to clean this mask, by immersing this mask (M1) in boiling water for 15 minutes. Among this group of workers, there were 3 workers who were on chelation treatment for high blood lead level. It was decided to check the blood lead level of the workers a month of using the mask.

Six months later, 7 ready to use respiratory masks were provided by HEG Ltd. These masks are marketed by Environ Care Products, New Delhi. In general these masks are expected to absorb obnoxious gases in the environment and capture the fine dust and so particles. The potential uses include passive subjects such as lay public and active subjects such as traffic police, farmers who spray insecticides and pesticides, painters, cement and stone industry workers etc. 5 of them were mesh masks (referred as M2 in this study) and 2 were breath-o-pollution masks (referred as M3 in this study). Both these types of masks are fitted with exhalation valves. They are soft, non toxic, foldable and can slip into the pocket. They use ACF as a filter. In the case of the breath-o-pollution masks (M3), the filter is detachable and it can be removed for regeneration or replacement, and the external surface is made of plastic. The mesh mask (M2) does not have a filter cartridge and the exterior is made of mesh. It can be regenerated by immersing the mask in boiling water for about 30 minutes. These masks were given to 7 workers, who were already using the previous mask (M1) which had worn out by then. They were asked to use these masks (M2 and M3) for one month, after which their blood lead was drawn in heparinized vacutainers and sent to NRCLPI, Bangalore.

The workers were instructed to clean the masks (M2 and M3) every week by immersing the mask or the cartridge (in case of M3), in hot water for 30 minutes and then dry them. This instruction was given by the authorities of HEG Ltd. as a unique property of an ACF fabric is the possibility to "reactivate" the fabric when it has become saturated, that it can be used again.

Results

Table 1 shows that there was a reduction in blood lead levels in the

Serial No	Blood Lead level taken six months before giving masks "A"	Blood lead level on the day ACF mask was given "B"	Difference of blood lead before using mask "B-A"	Blood lead level one month after ACF mask was given "C"	Whether on treatment	Difference in Blood lead level after using mask "B-C"
1	68.6	77.9	+9.3	67.1	No	-10.8
2	69.3	77.6	+8.3	74.1	No	-3.5
3	75.6	82.9	+7.3	80.3	No	-2.6
4	59.7	65	+5.3	65.1	No	+0.1
5	66.6	80.3	+13.7	91.8	No	+11.5
6	116.6	91.5	-25.1	76.5	Yes	-15
7	109.1	100.9	-8.2	74	Yes	-26.9
8	101.6	78.3	-23.3	80.1	Yes	+1.8

Table 1: Effect of ACF mask (M1) on blood lead level on battery workers.

Mask	Average Blood Lead before giving mask	Average Blood Lead after giving mask	Difference (%)
M 1	75.26 µg/dl	70.83 µg/dl	-5.9
M 2	82.95 µg/dl	74.1 µg/dl	-10.7
M 3	67.25 µg/dl	71.05 µg/dl	+5.7

Table 2: Effect of ACF masks (M1, M2, M3) on average blood lead levels.

(except in the case of the worker who showed a slight increase after using the mask), the ACF mask used here, seems to act like a preventive measure for checking lead poisoning.

According to a study on the effect of chelation on children, the lead which is once deposited in the brain is eliminated very slowly because of its half-life of 2 years in the brain. Moreover, once in the brain, lead cannot be removed by chemical chelating agents. Thus, it is clear that the only way to prevent lead poisoning is to prevent lead from getting