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Research Paper

Pulmonary function test in Petrol Pump workers of Ahmedabad

Medical Science

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ABSTRACT

In urban cities like Ahmedabad, there is rapid increase in automobile Vehicles and because of this the number of petrol pumps are also increased. Most of these petrol pumps are located in congested cities, near shopping complexes where the movement of automobile vehicles is very high. These vehicles discharge pollutants like nitrogen oxides,' carbon monoxide, suspended particulate Matter (SPM) which may have some effects on the pulmonary function. Hence PEFR measurement was done in 50 petrol pump workers to evaluate any effect of them.

Material and method

About fifty petrol pump male workers were taken for PEFR values, Mini peak flow meter was used. In recent years ,PEFR have become more common endpoints in epidemiological studies of occupational respiratory hazards.The inexpensive portable Peak flow meter provides an attractive alternative to spirometer for such studies. In all these workers the average values in different age group, influence of smoking habit over these value are determined the prevalence of PEFR abnormality is estimated by calculating percentage of predicted value determined in the present study normal subjects. The regression equation is estimated in these all groups of workers.

RESULTS

The anthropometric findings and PEFR value of petrol pump workers [only males) is given in Table—l. Overall these workers have mean height 166.7 cms, weight 55.2 kgs and PEFR 435.9 lit. In younger age groups higher values in PEFR is observed and this value is deteriorated in older age group (above 40).A comparison of PEFR value according to smoking habits in petrol pump workers in Table—2 showed lower value in smokers in comparison to nonsmokers. However the results are not significant. In comparison to clinically normal subjects (Table—23) petrol pump workers showed significant increase in height and significantly low PEFR. An observation of PEFR values according to duration of exposure in Table—4 indicated linear decrease in values with increasing duration of exposure .In Tab1e—5 shows regression equation for prediction of PEFR developed among petrol pump workers. The prevalence of PEFR abnormality among petrol pump workers is given in Table-6. Overall 36.0 percent exhibited abnormality and this abnormality is higher in above 40 years age group in compa-rison to 20-39 years age group.

TABLE-1

Anthropometric findings and PEFR values among petrol pump workers (only male).

Age Group	No. of Subjects	Height (cms)	Weight (Kg)	PEFR (Lit/Min)
Up to 14	Nil	-	-	-
15-19	2	166.3 +1.9 -	41.0 + 0.0 -	480.6 +9.0 -
20-39	37	168.3 +11.1 -	54.1 +9.8 -	449.4 +110. -
40	11	161.7 +17.6 -	55.2 +9.8 -	384.5 +131. -
Total	50	166.7 12.7	55.2 9.8	435.9 115.3

TABLE-2

Comparison of PEFR in petrol pump workers value according to smoking habits

Smoking Category	No. of Subjects	PEFR Lit/Min.
Nonsmoker	21	484.7 +110.5 -
Smoker	16	421.7 +104.3

TABLE-3

PEFR value comparison between petrol pump workers and clinically normal subjects (20-39 years age group).

Parameter	Clinically Normal N = 54	Petrol Pump Workers N = 37
Height (cms)	163.5 +5.9	169.3 ** +11.1
Weight (Kgs)	52.1 +7.9	54.1 +9.8
PEFR (Lit/Min)	516.0 +92.5	449.4 ** +110.1

N = Number of subjects.
** = Significant at 1% level.

TABLE-4

Duration of exposure and PEFR value among petrol pump workers.

Parameter	Duration of Exposure -5	6-10	11-15	16
No.of subjects	16	22	4	8
Age (Years)	25.6 +5.4	27.9 +6.7	36.7 +6.9	43.0 +3.9
PEFR Lit/Min	464.6 +106.9	446.5 +109.3	430.2 +132.9	355.1 +140.0

TABLE-5

Regression equation for prediction of PEFR in petrol pump workers.

Parameter	Regression Equation	RSD	R2
PEFR	0.89 H - 5.36 A + 5.69 W+ 114.5	102.6	0.21

H = Height (cms)
A = Age (years)
Weight (Kgs)

TABLE-6

Prevalence of PEFR abnormality among petrol pump workers.

Age Groups	No.of Subjects	Prevalence
Total	50	18 (36.0)
Upto 14	2	Nil
15-19	Nil	-
20-39	37	13 (35.1)
40	11	5 (45.5)

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DISCUSSION

In this study, petrol pump workers are taken from petrol pump stations located in the city area of Ahmedabad. Earlier studies conducted in shopkeepers located near traffic junctions of Ahmedabad having varying levels of oxides nitrogen (Nox) shared decrease in pulmonary function test values including PEFR potentiated by smoking.93 The levels of Nox varies from 74.0 ug/m3 to 164.1 ug/m3 and these levels were higher than the air quality standards prescribed for India6, The effect of automobile exhaust near traffic junctions produced significant effect in shopkeepers than in traffic policemen.94 As these automotive vehicles movement is higher in city and the petrol pump workers are also exposed to these pollutants from the ambient environment as well as the pollutants discharged into ambient environment petrol fuels may be responsible for significantly low PEFR. Interestingly, the height is significantly high in petrol pump workers suggesting that PEFR reduction is only associated with the effects of pollutants linear decrease in PEFR associated with increasing duration of exposure suggests a trend of the effects of ambient environmental pollutants .A prevalence of PEFR abnormality in this present petrol pump workers is 36.0 percent which is very much higher than that seen in shop-keepers 19.1 percent and 6.9 percent in traffic policemen. A follow up study only indicates the exact cause of this higher prevalence.

Conclusion:

In petrol pump workers the PEFR value is significantly low compared to clinically normal, lower values in smokers as compared to nonsmoker and a linear decrease in values with increasing duration of exposure is seen.

REFERENCE

(1)Hankinson J.L., Filios M.S. Kinsley ,K.B. petson K.B. petson K.E.l. : Comparison of mini wright and spirometer measurement of peak flow(in Pres) | (2) Mohan Rao N,Patel T.S., Raiyani C.V., kulkarni P.K., Agarwal , A.L., Kashyap S.K. and Chatterji S.K. : adose response relationship between pollution index and pulmonary function in shop keepers exposed to auto exhaust .Ind.J.Environm.protection 11(10) 737 (1991) | (3) Mohan Rao N,Patel T.S.,Raiyani C.V., kulkarni P.K., Agarwal , A.L. and Kashyap S.K. : Autoexhaust pollutants exposure and pulmonary function .A comparison between shopkeepers and traffic policemen . Ind. J. Environm. protection 12(3) , 171 (1992) | (4) Mohan Rao N.,Parikh J.R. Mavlankar M.G. , kulkarni P.K. and Chatterji B.B. Acute and chronic changes in ventilator Function in textile workers. Ind. J. Environm. protection 11(9) :654 (1991)