

DERMATOSES AND HEMATOLOGICAL DISORDERS AMONG CAR MECHANICS IN ZAGAZIG CITY AND THEIR EFFECTS ON QUALITY OF LIFE

By

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ABSTRACT

Background: Car mechanics are exposed to a wide range of industrial chemicals which result in various forms of skin diseases and conditions such as various types of dermatitis, skin sensitization, eczema, oil acne, etc.). Exposure to organic solvents especially benzene, has been shown to have a deleterious effect on bone marrow. Skin diseases, particularly chronic skin diseases, have a negative impact on patient's quality of life. In addition quality of life is impaired in persons with anemia which produces a high level of fatigue. **Objectives:** The objectives of this study were to (1) Determine prevalence and types of dermatoses and hematological disorders among car mechanics in Zagazig City, (2) Study some risk factors associated with the detected skin and blood disorders, and (3) Clarify the effects of skin and blood disorders on the workers' quality of life. **Methods:** A comparative cross-sectional study was conducted in 105 car mechanics in car repair shops in Zagazig City and 110 unexposed workers from faculty of medicine and some school workers. Data were collected by a questionnaire, clinical examination and laboratory investigation, and those who were diagnosed clinically or by investigation were subjected to a questionnaire to study the effects of these disorders on their quality of life. **Results:** The total prevalence of dermatoses among car mechanics (57.1%) was significantly higher compared with their controls (18.2%). The majority of car mechanics had contact dermatitis (25.7%), followed by wounds & burns (10.5%) and oil acne (4.8%). The self-reported prevalence of HE among car mechanics (23.8%) was significantly higher when compared with controls (8.2%). A significant association was noticed between prevalence of dermatoses and age, duration of work, childhood eczema and benzene hand washing. The most dermatological disorders had significant effects in lowering QOL were eczema, wounds & burns. Hematological parameters showed that car mechanics had decreased erythrocyte, hemoglobin, hematocrit values, lymphocyte and platelets levels, but increased neutrophil levels. There was a significant association between hematological disorders and limitation of different quality of life domains especially physical functioning, fatigue and body pain. The majority of the studied groups had moderate impairment of the quality of life, while the minority had a bad effect on quality of life. **Conclusion:** Car repair workshop environment has adverse effects on health status of workers. Car mechanics had many dermatological disorders especially hand eczema and majority of them were anemic. The most important risk factor for dermatoses and hematological disorders were benzene or gasoline hand washing. These adverse effects are due to lack of safety measures, basic health awareness and all of which had significant effects on QOL.

Keywords: Car mechanics, Dermatoses, Hematological disorders & Quality of life

INTRODUCTION

Car mechanics are workers who repair cars and other automotive vehicles, or their systems and parts. They examine, make necessary repairs, replacements, adjustments, and present the repaired vehicle to their superior or to the customer⁽¹⁾. The number of jobs for automotive service technicians and mechanics is projected to grow faster than average for all occupations over the next decade.

Employment of automotive service technicians and mechanics is expected to increase 14 percent between 2006 and 2016, compared to 10 percent for all occupations⁽²⁾.

Many studies reported that the dermatological and hematological disorders represent the predominant health problems among automobile mechanics⁽³⁾. Car mechanics are exposed to a wide range of industrial chemicals including heavy

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metals, contained in brake fluids, degreasers, detergents, lubricants, metal cleaners, fuel as benzene, solvents and asbestos (from brake repair) as well as welding fumes and car exhausts ⁽⁴⁾. These exposures resulting in various forms of skin diseases and conditions such as various types of dermatitis, skin sensitization, eczema, oil acne, etc.) caused by various chemicals, e.g.: adhesives, asbestos, antifreeze and brake fluid, epoxy resins, gasoline, oils, nickel ...etc ⁽¹⁾.

Workers with benzene exposure from vehicular sources had hematological and immunological alterations. Subchronic and chronic exposures to benzene vapors induce a progressive depletion of the bone marrow and dysfunction of the hematopoietic system ⁽⁵⁾. Some studies reported that the incidence rate of leukemia (all types) in vehicle mechanics is increased more than 60 times ⁽⁶⁾. The European regulations classify gasoline as "carcinogenic agent" because of its content of benzene (>0.1%) ⁽⁷⁾.

Quality of life (QOL) is an established parameter in dermatology; it is known that the skin diseases can affect QOL adversely. Skin diseases, particularly chronic skin diseases, have a negative impact on patient's quality of life ⁽⁸⁾, ⁽⁹⁾. In addition quality of life is impaired in persons with anemia which produces a high level of fatigue ⁽¹⁰⁾.

Thus, this study was planned to (1) determine prevalence and types of dermatoses and hematological disorders among car mechanics in Zagazig City, (2) study some risk factors associated with the detected skin and blood disorders, and (3) clarify the effects of skin and blood disorders on the workers' quality of life.

SUBJECTS AND METHODS

Study design:

A comparative cross-sectional study was conducted among car mechanics during the period from May through October 2009 in car repair shops in Zagazig City in Sharkia Governorate.

Study workers selection

1- Car mechanics (exposed group): workers in car repair shops in Zagazig City with regular and direct exposure to chemicals, solvents, fuel as benzene, degreasers, lubricants, detergents, metal cleaners, and car exhausts on performing their jobs.

2- Non-exposed group: workers not exposed to benzene, solvents degreasers, and lubricants at their current occupation nor even had a past history of exposure to them. They were selected randomly from the (workers of the Faculty of Medicine, Zagazig University and some school workers) to match the car mechanics regarding age, educational level, residence, smoking habit and duration of work.

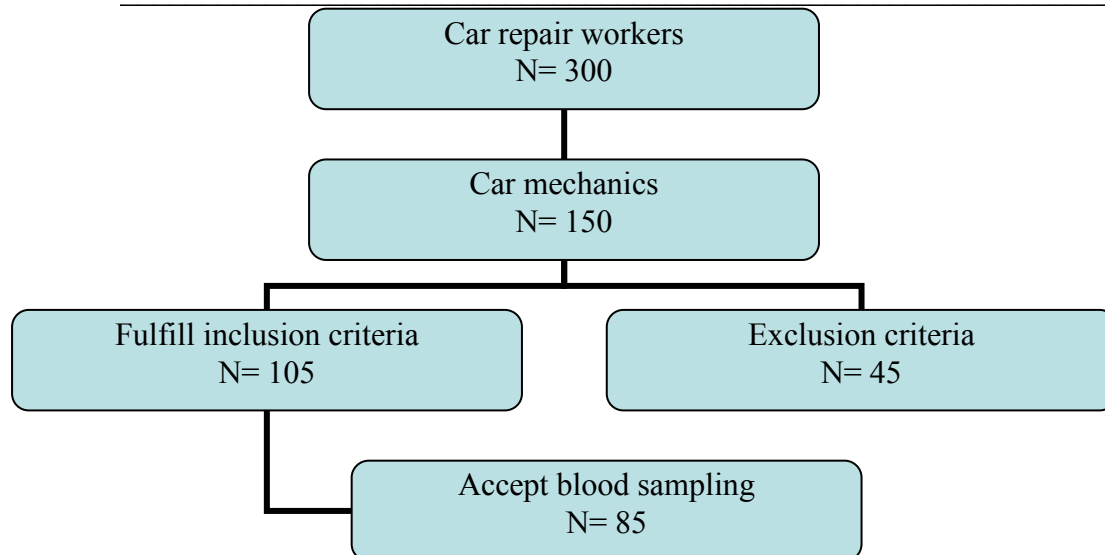
Sample selection

First, we had a list of all car repair shops in Zagazig City. A total number of 300 car repair workers working in 150 car repair shops as estimated by the city council composed of (car mechanics, tinkers, car painters and car welders). We select the whole car mechanics (150) working in the car repair shops in Zagazig City. Only 105 car mechanics that fulfill the inclusion criteria were included in the study.

Inclusion criteria:

- 1- Not report any symptoms or diseases that could affect the hematological parameters.
- 2- No history of drugs intake such as acetylsalicylic acid, steroids, and B-blockers 10 days before blood sampling.
- 3- No history of nutritional deficiency as (weight loss, muscle wasting, change in appetite or, GIT symptoms).
- 4- No past relevant occupational exposures which may affect the systems under study such as (pesticides- radiation-toxin as arsine and chemotherapy).

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An informed consent was taken from each participant shared in the study.

Methods:

All studied groups who were participating in the study were subjected to:

- 1- Pre-formed interview questionnaire prepared from **Nordic Occupational Skin Questionnaire (NOSQ)** ⁽¹¹⁾ for collecting the relevant personal and occupational data about the dermatological disorders and pre-designed questionnaire for the hematological symptoms.
- 2- Clinical examination of car mechanics for signs of dermatoses and hematological disorders. Also physical examinations for signs of iron deficiency anemia (spoon nail), pernicious anemia (smooth tongue), signs of nutritional deficiency as edema, muscle wasting and skin changes, hemolytic anemia (jaundice) were done.
- 3- Laboratory investigations in the form of:
 - Complete Blood Count (CBC): That includes leukocyte count (WBC), erythrocyte count (RBC), platelet count (PLT), hemoglobin (HGB), hematocrit (HCT) and red

blood indices as erythrocyte mean cellular volume (MCV), mean corpuscular hemoglobin (MCH), and mean corpuscular hemoglobin concentration (MCHC).

- Reticulocyte count: This test was done for anemic workers to exclude hemolytic anemia.
 - Iron tests (serum iron, total iron binding capacity) for workers with microcytic hypochromic anemia to exclude iron deficiency anemia.
- 4- Questionnaires for assessment the effects of the detected dermatoses and hematological disorders on workers' quality of life, which include:
- Dermatology Life Quality Index (DLQI): The DLQI is a 10-item questionnaire measuring quality of life (QOL) in patients with skin disease ⁽¹²⁾. The 10 items cover 6 aspects of daily life experienced during the past week:
 - (i) Symptoms and feelings (item 1,2)

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- (ii) Daily activities (items 3,4)
- (iii) Leisure (items 5,6)
- (iv) Work and school (item 7)
- (v) Personal relationships (item 8,9)
- (vi) Treatment (item 10).

Each item is assigned a score of 0 (not at all) to 3 (very much). The DLQI total scores are calculated by summing the score of each question, resulting in a maximum of 30 and a minimum of 0. The DLQI total scores at baseline were dichotomized into high QOL (DLQI total score, 0-10) and low QOL (DLQI total score, 11-30), so the higher the score, the greater the impairment of QOL⁽¹³⁾.

- Structured questionnaire for measuring the effect of the detected hematological disorders on their quality of life, as there is no specific quality of life measures for these effects. It includes the generic SF-8 questionnaire⁽¹⁴⁾ (Short form 8 questionnaire) in addition to other questions that are relevant to the hematological disorders which occur among car mechanics. Scoring method of the structured questionnaire was classified into good (score=1), moderate (score=2) and bad (score=3). If the total scores was >75% (bad QOL), (50-75%) (moderate QOL), <50% (good QOL).

5- Statistical analysis:

Statistical analysis was done using SPSS software package version 16 using frequency distribution table & means and standard deviation for descriptive purposes, chi-square test for comparison between proportions and student's t-test for comparison between groups' means. The results

were considered significant when p-value < 0.05.

RESULTS

Exposed and non-exposed workers were comparable with regard to age, educational background, smoking habits, family history of atopy, childhood eczema and duration of work. The self-reported prevalence of hand eczema (HE) among car mechanics (23.8%) was significantly higher when compared with controls (8.2%) (**Table 1**).

Seventy-five (71.4%) of exposed workers reported past 12 months skin symptoms compared with control group (21.8%). Seventy-six per cent of past 12 months skin symptoms was dryness of the skin without dermatitis. Sixty-one (81.3%) of car mechanics who reported past 12 months skin symptoms also reported that is work related. Most (86.9 %) of those who reported work related skin symptoms, reported that it improved during times off work compared with (44.4%) for the control group.

Ninety-one (86.7%) of car mechanics wash their hand with benzene or gasoline compared with no body of the control group and no one of car mechanics in the study was wearing protective gloves whereas only small percentage of the control group use protective gloves (6.4 %). Regarding the durations of daily exposures of the studied groups, car mechanics reported highest exposures to benzene or gasoline and oil greases >2h/day (60.0 %, 53.3 %) respectively, whereas no body of control group show any daily exposures to these substances.

The prevalence of dermatoses as diagnosed by a dermatologist was high in the exposed group (57.1%) compared with the non-exposed group (18.2%) (**Table 2**).

The majority of car mechanics had contact dermatitis (25.7%). Other dermatological disorders reported among car mechanics such as wounds & burns (10.5%), oil acne (4.8%), contact urticaria & pigmentary disorders (3.8%) and nail disorders (3.8%) and the most common

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affected areas were the hands & arms (47.6%). Three (2.9%) car mechanics had other skin diseases (tinea-acne vulgaris-vitiligo) (**Table 3**).

A significant association was found between the prevalence of skin diseases and young age (≤ 30 years), childhood eczema, gasoline hand washing and duration of work for 10 years or less.

Table 4 shows the logistic regression analysis of risk factors associated with skin diseases. Work duration, childhood eczema and benzene or gasoline hand washing were the most significant risk factors.

Considering haematological changes in the studied groups, **table 5** showed that car mechanics had decreased erythrocyte, hemoglobin, hematocrit values, lymphocyte and platelets levels, but increased neutrophil levels. The hematological disorders were clinically reported by a physician (**31.4%**) less frequently than what was found in the questionnaire (**82.9%**).

Higher frequency of hematological disorders was among car mechanics exposed to oil & greases and gasoline or

benzene for more than 2 hours daily (**50%**, **58.4%**) respectively. The only significant risk factor for hematological disorders among car mechanics was benzene or gasoline hand washing (**p<0.001**).

Table 6 revealed that both groups under study with dermatoses had low QOL (**58.3%**, **53.8%**) respectively. The most dermatological disorders had significant effects in lowering QOL were eczema, wounds & burns (**p<0.001**).

There was a significant association between hematological disorders and limitation of different quality of life domains especially physical functioning, fatigue and body pain. Forty (**55.6%**) car mechanics with hematological changes suffered shortness of breath some of the time, while (**47.2%**) of them felt weakness some of the time. As regards to the overall effect of hematological disorders on quality of life, this study showed that the majority of the studied groups had average impairment of the quality of life, while the minority had a bad effect on quality of life (**Figure 1**).

Table (1): Demographic and occupational characteristics of the studied groups

Characteristics		Car mechanics (N=105)	Control group (N=110)
Age	$\leq 30y$	n (%) 67 (63.8%)	62 (56.4%)
	$> 30y$	n (%) 38 (36.2%)	48 (43.6%)
Education:	Illiterate	n (%) 51 (48.6%)	61 (55.5%)
	Read and write	n (%) 39 (37.1%)	36 (32.7%)
	Primary education	n (%) 9 (8.6%)	6 (5.5%)
	Secondary school	n (%) 6 (5.7%)	7 (6.4%)
Smokers	n (%)	54 (51.4%)	63 (57.3%)
History of childhood eczema	n (%)	14 (13.3%)	9 (8.2%)
History of atopy	n (%)	13 (12.4%)	8 (7.3%)
Self reported hand eczem	n (%)	25 (23.8%)	9 (8.2%)*
Duration of work (years)	($\bar{X} \pm SD$)	9.19 \pm 6.23	5.83 \pm 4.1**

* p< 0.01 ** p< 0.001.

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Table (2): Prevalence of dermatoses among the studied groups.

	Car mechanics (N=105)		Control group (N=110)		χ^2	O.R (95%CI)	p-value
	NO	%	NO	%			
Skin diseases						6.0 (3.09-11.73)	0.000
Positive	60	57.1	20	18.2	34.9		
Negative	45	42.9	90	81.8			

Table (3): Types of dermatoses in car mechanics and control group.

Types of dermatoses	Car mechanics (N=105)		Control group (N=110)		χ^2	OR (95%CI)	p-value
	NO	%	NO	%			
Contact dermatitis (Hand eczema)	27	25.7	6	5.5	16.97	6.0 (2.22-17.1)	0.000
Oil acne (Folliculitis)	5	4.8	0	0.0	5.36	undefined	0.02
Contact urticaria & pigmentary disorders	4	3.8	1	0.91	1.99	4.3 (0.44-103.14)	0.16
Wounds & burns	11	10.5	2	1.8	7.09	6.3 (1.28-42.4)	0.007
Nail disorders	4	3.8	4	3.6	0.00	1.05 (0.21-5.15)	0.95
Others (acne vulgaris- tinea-wart-vitiligo)	3	2.9	7	6.4	1.49	0.43 (0.09-1.93)	0.222
More than one lesion	6	5.7	0	0.0	6.47	undefined	0.01

Table (4): Logistic regression analysis of risk factors associated of skin diseases.

variable	B	SE	Wald	Sig	(95%CI)
Age	0.650	0.592	1.207	0.272	(0.164-1.665)
Work duration	1.317	0.632	4.338	0.037	(0.078-0.925)
Childhood eczema	2.159	0.872	6.128	0.013	(0.021-0.683)
Benzene or gasoline hand washing	1.471	0.711	4.286	0.038	(0.057-0.925)

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Table (5): Hematological parameters for car mechanics and control group.

Parameters	Car mechanics (N= 85)	Control group (N= 88)	t	P value
WBC (K/ul)				
\bar{X}	5.733	5.792	0.316	0.752
SD	(1.244)	(1.216)		
RBC (M/ul)				
\bar{X}	4.393	5.201	8.983	0.000
SD	(0.64)	(0.54)		
HGB (g/dl)				
\bar{X}	12.969	14.703	10.751	0.000
SD	(2.314)	(0.736)		
HCT (%)				
\bar{X}	38.382	43.659	8.438	0.000
SD	(5.49)	(2.034)		
PLT (K/ul)				
\bar{X}	203.55	215.23	1.669	0.09
SD	(53.88)	(36.83)		
WBC differential (%)	$\bar{X} \pm SD$	$\bar{X} \pm SD$		
Lymphocyte	30.38 ± 15.55	33.9 ± 14.81	1.5	0.13
Monocyte	2.56 ± 1.66	2.55 ± 1.57	0.08	0.93
Eosinophil	2.35 ± 2.42	2.98 ± 2.22	1.7	.07
Basophil	0.36 ± 0.53	0.35 ± 0.57	0.15	0.88
Neutrophil	64.0 ± 15.89	59.9 ± 14.63	1.75	0.08
Bands	0.21 ± 1.11	0.34 ± 1.39	0.67	0.5

Table (6): The relationship between the Dermatological Life Quality Index (DLQI) and the studied groups with dermatological disorders.

DLQI	Car mechanics with dermatoses (N=60)		Control group with dermatoses (N=13)		χ^2	OR (95%CI)	p-value
	NO	%	NO	%			
QOL on DLDI							
High QOL	25	41.7	6	46.2	0.08	0.83 (0.22-3.25)	0.76
Low QOL	35	58.3	7	53.8			

High QOL (quality of life) = DLQI total score (0-10); Low QOL= DLQI total score (11-30).

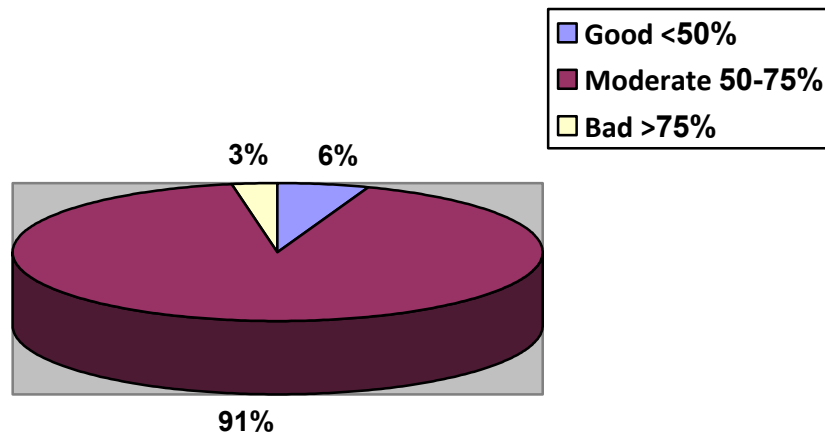


Figure (1): Pie diagram showing the classification of car mechanics in relation to degree of quality of life impairment.

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DISCUSSION

Working in an auto shop can pose significant occupational hazards for auto-mechanics, even today (15). Car repair workers are at risk of developing morbidity including occupational dermatoses because of their exposure to skin irritating substances such as oils, greases, solvents and detergents (16).

According to the United States Bureau of Labor Statistics, occupational skin diseases mostly in the form of irritant and allergic contact dermatitis are the second most common type of occupational diseases. About 75% of such cases result from contact with an irritant, while 25% occur due to contact with an allergen (17). Also, workers who expose to benzene from vehicular sources had hematological and immunological alterations (5).

Skin diseases, particularly chronic skin diseases, have a negative impact on patient's quality of life. In addition quality of life is impaired in persons with anemia which produces a high level of fatigue (8), (9).

Therefore, this study consists of two parts. On the one hand, dermatological and hematological disorders were sought in car mechanics. On the other hand, the effect of these disorders on workers' quality of life was determined.

The development of occupational skin disease, which mainly consists of hand dermatitis, is determined by a combination of endogenous (individual susceptibility) and exogenous (exposure characteristics) factors (18), (19). Hand eczema is the main occupational skin disease and affects a large proportion of the population of working ages (20).

In the present study, the self-reported prevalence of hand eczema (23.8%) among car mechanics as well as the prevalence as diagnosed by a dermatologist (25.7%), was significantly higher when compared to control group (8.2% and 5.5%, respectively). This occupation is generally considered as high-risk occupation for HE

with exposure to both contact irritants and allergens.

In this study the self-reported prevalence of hand eczema among car mechanics (23.8%) was lower than that clinically reported (25.7%). This means that the self reported 1- year prevalence of hand eczema considerably underestimates the true prevalence. Thus, self-reported prevalence of hand eczema can be validated if a dermatologist examines the subjects.

The 1-year prevalence of HE among car mechanics in this study was higher than in car mechanics in a previous study (21). And was lower than what was reported in another study (22). Whereas, prevalence as diagnosed by a dermatologist was higher in this study than in other studies among car mechanics (23). The different prevalence rates of HE related to differences in methodology, identification of persons with contact dermatitis and disease definition.

Returning to the aggravating factors at workplace, this study revealed that (86.7%) of car mechanics wash their hands with benzene or gasoline compared with no body of the control group with a highly significant difference between them.

These findings were near the findings found in previous studies (24), (25), (16), which were (62.5%, 78% and 67.8%) respectively of vehicle mechanics used gasoline or organic solvents for hand washing. Dermal exposure to organic solvents can defat the skin and thereby increase the uptake of these solvents by the body. In -addition, friction against the skin (e.g. from operating grinding machines and other equipments) can abrade or scrape away the skin. This can diminish the protective action of skin against irritants and allergens (26), (16).

Dermatological disorders:

The prevalence of dermatological disorders in this study was significantly higher among car mechanics when compared to control group. Car mechanics were at six times increased risk of skin

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diseases (**OR=6**) than the control group, as in this type of work, car mechanics are usually exposed to irritants and allergens present in an occupational setting which is capable of causing irritant and allergic contact dermatitis. Many subjects reported that their symptoms improved during times off work, and these were often regarded as being work related. However, not all symptoms reported as work related improved during absence from work. This could reflect the tendency of dermatitis to become chronic.

The vast majority of the occupational dermatoses cases are contact dermatitis (**25.7%**). This result is in accordance with previous studies ⁽²⁷⁾, ⁽¹⁶⁾, which were (**23.9%**, **24.1%**) respectively among car mechanics.

In contrast, previous studies ⁽²⁸⁾, ⁽²⁹⁾ reported higher frequencies (**59% and 55%**) of contact dermatitis among car repair workers as these studies include all tasks and task associated exposures to irritant at the workplace, the results were not only representative for car mechanics but also car tinkers, car painters.

There were other dermatological disorders reported among car mechanics such as wounds & burns (**10.5%**), oil acne (**4.8%**), contact urticaria & pigmentary disorders (**3.8%**), and nail disorders (**3.8%**).

The present study showed that the most common affected areas were the hands & arms (**47.6%**). These observations agree with previous researches ⁽³⁰⁾, ⁽³¹⁾, ⁽³²⁾, ⁽³³⁾.

Hematological disorders:

Car mechanics are exposed to residual used gasoline engine oils that accumulate on auto-mobile parts, tools, workbenches, floors and equipment ⁽³⁴⁾, ⁽³⁵⁾. It has been shown that car mechanics are particularly exposed to benzene while working on motors (tuning and repair of carburetors) and especially, on fuel tanks ⁽³⁶⁾. Also, older study ⁽³⁷⁾ noted that during the same type of work the benzene concentration in the breathing zone could reach 1.1 ppm (3.5 mg/m³).

Benzene is well known for its hematological and leukemogenic properties, as prolonged benzene exposure can induce bone marrow toxicity, which is expressed in decreased blood cell counts ⁽²⁴⁾.

Epidemiological studies show that fuel workers, mechanics and service station attendants have increased risk of hematological diseases and cancer such as leukemia and lymphoma ⁽³⁸⁾.

In this study, the hematological disorders were clinically reported by a physician (**31.4%**) less frequently than what was found in the questionnaire (**82.9%**). These results are in agreement with a previous study among the car mechanics. This may be attributed to false-positive answers in some cases caused by confusion with other diseases such as malnutrition, hypothyroidism and organ failure. Thus, self reported prevalence of hematological disorders can be validated by clinical examination and laboratory investigations.

An exposure-dependent decrease in erythrocyte and hemoglobin concentrations was demonstrated in automotive workers who manually washed parts with kerosene and use petrol or mixture of petrol to clean engine parts and to wash their hands ⁽³⁹⁾, ⁽⁴⁰⁾.

In this study, the prevalence of hematological changes was significantly higher among car mechanics (84.7%) when compared to control group (31.8%) (**p<0.001**). The exposed subjects had decreased erythrocyte, hemoglobin, hematocrit values, lymphocyte and platelets levels, but increased neutrophil levels. Same results have been reported in other studies performed in different countries ⁽⁴¹⁾, ⁽⁴²⁾, ⁽²⁵⁾ ⁽⁵⁾.

Consistent with our results, decreased hemoglobin level in automobile station workers have been reported ⁽⁵⁾. Also, a previous study ⁽⁴¹⁾ showed slight diminution in RBC and hematocrit in vehicle mechanics.

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In contrast to our study, previous study⁽⁴⁴⁾ found no association between hematological parameters and benzene exposure. This may be attributed to the fact that the study was specifically designed to investigate decreases in hematological parameters in low benzene exposed workers in a well- controlled working environment. Also, may be due to the exposure amount could be low enough not to cause hematopoietic diseases.

Decreased lymphocyte counts are an early and consistent finding in workers in whom benzene toxicity was evident, and there is evidence that the conditions disappear when the worker is removed from benzene exposure⁽⁴⁴⁾.

In agreement with these findings, our study revealed decreased lymphocyte counts in car mechanics than the control group but there were no statistically significant differences between both groups.

Factors affecting car mechanics dermatoses:

This study showed a significant association between the prevalence of dermatoses and younger car mechanics aged ≤ 30 years, childhood eczema, gasoline hand washing and duration of work for 10 years or less. Also, another study⁽⁴⁵⁾ found that age was inversely related to 1-year prevalence of hand eczema, and the highest value was detected among those aged 20-29 years and explained it by low seniority and poor job training.

The higher frequency of dermatological disorders among car mechanics working for 10 years or less may be due to lack of experience and training on handling material and lack of resistance to chemicals which developed by continuous exposure.

This observation is in contrast with other studies^{(46), (31), (16)} which reported that the prevalence of occupational dermatoses increases with the increase in the duration of work. This is explained by the fact that the longer duration of work

the higher level of exposure to affecting agents.

Finally, logistic regression analysis of factors affecting dermatoses outcome among car mechanics revealed that the duration of work, history of childhood eczema and benzene or gasoline hand washing are the most important risk factors for development of dermatological disorders.

Factors affecting car mechanics hematological disorders:

In the present study, a higher frequency of hematological changes was among younger car mechanics aged ≤ 30 years, unsmokers and duration of work for 10 years or less but without significant association.

Results of this study showed increased risk (**OR=27.2**) among car mechanics for hematological disorders with benzene or gasoline hand washing. The only significant risk factor for hematological disorders among car mechanics was benzene or gasoline hand washing (**p<0.001**)

Nearly the same results were reached by a previous study⁽⁴⁷⁾ which reported a significant lower hemoglobin values among automobile mechanics washing of their hands with petrol. This explained by the fact that primary route of exposure to benzene and volatile chemical organic compounds, is by inhalation and through the skin when the study subjects either washed their hands and/or vehicle parts or tools with gasoline or benzene.

Quality of life and dermatological disorders:

Quality of life (QOL) is an established parameter in dermatology; it is known that skin diseases can affect QOL adversely⁽⁸⁾. Many studies stated that severe occupational hand eczema and severe impairments of QOL at baseline were strong prognostic predictors of prolonged sick leave. This indicates that QOL and standardized severity assessment may be valuable tools to identify patients at high

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risk of prolonged sick leave and unemployment⁽¹³⁾.

Poor QOL scores in workers with dermatoses have been reported previously and our study support these findings⁽⁴⁸⁾,⁽⁴⁹⁾,⁽⁵⁰⁾,⁽⁵¹⁾,⁽⁵²⁾. Our study showed that both groups under study with dermatoses had low QOL (**58.3%**, **53.8%**) respectively. The most dermatological disorders had highly statistically significant effect in lowering QOL were eczema, wounds & burns (**p<0.001**).

Quality of life and hematological disorders:

Quality of life is impaired in persons with anemia and produces a high level of fatigue. All of these adverse outcomes are strongly linked to hemoglobin concentration⁽⁵³⁾,⁽¹⁰⁾. There was a significant association between hematological disorders and limitation of different quality of life domains especially physical functioning, fatigue and body pain. This is in accordance with the previous finding⁽⁵⁴⁾ which reported that fatigue is the most frequently reported symptom of anemia, and subjectively the most disturbing deficit on quality of life. Similarly, a previous study⁽¹⁰⁾ stated that hematological disorders especially anemia may significantly impair patient quality of life.

As regards to the overall effect of hematological disorders on quality of life, our study showed that the majority of the studied groups had moderate impairment of the quality of life, while, the minority of car mechanics had a bad one.

CONCLUSION AND RECOMMENDATIONS

Car repair workshop environment has adverse effects on health status of workers. Car mechanics had many dermatological disorders especially hand eczema and majority of them were anemic. The most important risk factor for dermatoses and hematological disorders were benzene or gasoline hand washing. These adverse effects are due to lack of safety measures, basic health awareness and all of which

had significant effects on QOL. So we recommend enlightenment campaign to educate car mechanics and workshops owners on the negative health implication of exposure at their work. Also, we recommend legislation on mandatory provision of personal protection and provide training on how to wear it properly.

ACKNOWLEDGEMENTS

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الأمراض الجلدية والإضطرابات الدموية لدى العاملين في إصلاح السيارات بمدينة الزقازيق وتأثيرها على جودة الحياة.

إن عمال تصليح السيارات يتعرضون لحزمة واسعة من المواد الكيميائية الصناعية مثل المعادن الثقيلة وزيت المكابح و مواد التشحيم والمنظفات و مواد إزالة الشحوم والمذيبات والأسيتوس الموجود في تيل الفرامل وأبخرة اللحام وعوادم السيارات . وينتج عن التعرض لهذه المواد أشكال مختلفة من الأمراض الجلدية مثل حساسية الجلد والأكزيما وحب الشباب التي تسببها المواد الكيميائية المختلفة وكذلك التعرض التدريجي للبنزين خلال العمل لفترة طويلة يؤدي إلى خلل وظيفي في أنظمة الدم والمناعة وفي دراسة سابقة تبين أن الأمراض الجلدية خاصة المزمنة منها وكذلك أمراض الدم لها تأثير سلبي على جودة الحياة.

هدف البحث:

- 1- توضيح أكثر المشاكل الجلدية وأمراض الدم شيوعا في العاملين في إصلاح السيارات في مدينة الزقازيق.
- 2- توضيح عوامل الخطورة الشخصية والمهنية المرتبطة بأمراض الدم والأمراض الجلدية في العاملين في تصليح السيارات.
- 3- توضيح مدى تأثير الأمراض الجلدية وأمراض الدم على جودة الحياة.

طرق البحث:

- : أجريت هذه الدراسة على مجموعتين من العمال
- المعرضون: العاملين في تصليح السيارات في مدينة الزقازيق.
 - العينة الضابطة : العاملين في كلية الطب جامعة الزقازيق وبعض عمال المدارس
- بروتوكول الدراسة : تشمل على الآتي
1. استبيان لجمع معلومات شخصية ومهنية.
 2. فحص إكلينيكي جلدي وأمراض الدم.
 3. صورة دم كاملة (CBC)، Reticulocyte count, iron tests.
 4. استبيان المقياس الجلدي وأمراض الدم لجودة الحياة

النتائج :

أوضحت هذه الدراسة أن ٧٦% من عمال تصليح السيارات يعانون من جفاف جلد الأيدي بالمقارنة ب ٣٧,٥% بالنسبة للمجموعة الأخرى. كما أظهرت أيضا أن ٨٦,٩% من العمال الذين يعانون من أعراض جلدية بسبب العمل تحسّنوا أثناء فترات الراحة من العمل مما يزيد من احتمالية أنها بسبب تعرضهم أثناء العمل. بالنسبة لعوامل الخطورة في العمل لقد أظهرت هذه الدراسة اختلاف احصائي بين المجموعة المعرضة والعينة المقارنة من ناحية غسل الأيدي بالبنزين حيث كانت بنسبة ٨٦,٧% بين عمال تصليح السيارات مع عدم استخدامهم مهمات الوقاية الشخصية (القفازات) أثناء العمل وأما من حيث التعرض للبنزين والزيوت والشحوم مدة أكثر من ساعتين في اليوم فقد أظهرت الدراسة أنها الأكثر حدوثا بين عمال تصليح السيارات بنسبة ٦٠% و ٥٣,٣% بالترتيب.

وقد أظهرت هذه الدراسة أن أعلى نسبة للإصابة بالأمراض الجلدية كانت بين عمال تصليح السيارات ٥٧,١% بالمقارنة ب ١٨,٢% بين المجموعة الضابطة مع زيادة معامل الخطورة حوالي ٦ مرات.

وأوضحت هذه الدراسة أن الأنتهاب الجلدي التماسي كان الأكثر شيوعا بين عمال تصليح السيارات بنسبة ٢٥,٧% يليه الجروح والحروق ١٠,٥% يليه حب الشباب المسبب بالتعرض للزيوت ٤,٨% ثم الأرتكاريا بالتلامس والاضطرابات الصبغية 3.8% واضطرابات الأظافر ٣,٨%.

كما أظهرت الدراسة ان نسبة الإضطرابات الدموية المشخصة اكلينيكيًا ٣١,٤% كانت اقل منها في الاستبيان ٨٢,٩%. وأظهرت نتائج صورة الدم الكاملة انه هناك نقص في عدد كرات الدم الحمراء ، الهيموجلوبين ، الهيماتوكريت ، اللمفاويات والصفائح الدموية. وكانت هناك فروق ذات دلالة إحصائية بين عمال تصليح السيارات عنها بين الضابطة بالنسبة لمتوسط الهيموجلوبين.

وعند استخدام تحليل الإنحدار اللوجستي، فقد وجد أن مدة العمل ، التاريخ المرضي للإصابة بالإكزيما و غسل الأيدي بالبنزين هي من أهم عوامل الخطورة المرتبطة بحدوث الأمراض الجلدية. على الجانب الأخر كان غسل الأيدي بالبنزين فقط من أهم عوامل الخطورة المرتبطة بحدوث الإضطرابات الدموية.

كما أظهرت هذه الدراسة أن الأمراض الجلدية في المجموعتين لها تأثير على جودة الحياة خاصة الإكزيما والجروح والحروق. كما أظهرت النتائج أن كل أجزاء جودة الحياة قد تأثرت بالإضطرابات الدموية خاصة المشاكل البدنية ، الشعور بالإجهاد ووالإحساس بالام جسدية. ولقد خلصت هذه الدراسة الى أن غالبية المجموعتين كانت جودة حياتهم متوسطة في حين ان نسبة قليلة كانت جودة حياتهم سيئة.

الخلاصة:

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من هذه الدراسة نخلص إلى أن بيئة ورش العمل لعمال تصليح السيارات لها تأثير واضح على الحالة الصحية للعاملين بها خاصة الأمراض الجلدية والإضطرابات الدموية حيث كانت هناك نسبة واضحة من الأمراض الجلدية خاصة إكزيما اليد. كما أن غالبية عمال تصليح السيارات كانوا يعانون من انيميا حيث كان هناك نقص واضح فى عدد كرات الدم الحمراء ، الهيموجلوبين والهيماتوكريت وكان غسل الأيدي بالبنزين هو من أكثر العوامل المؤثرة فى حدوثهم وهذه النتائج كانت بسبب عدم اتخاذ اجراءات وقائية وقلة المعرفة باجراءات السلامة المهنية مما كان لها تأثير واضح على جودة الحياة. لذا توصى الدراسة بتنفيذ برنامج تثقيف صحى وتوعية العمال عن الأضرار الصحية لبيئة العمل مع توفير مهمات الوقاية الشخصية وتدريبهم على الاستخدام الصحيح لها.