

INTRODUCTION AND LITERATURE REVIEW

1.1 Allergy:

'Allergy' is the term often used loosely to describe any intolerance of environmental factors irrespective of any objective evidence of immunological reactivity to an identified antigen.(1)

patients often present to an allergy clinic because of a popular public perception that they are 'allergic' in origin To Define These Mutually Exclusive Terms Allergy – is used to define those conditions in which antigen specific IgE or sensitized T cells play a definite role Atopy – is a state of disordered immunity in which Th2 lymphocytes drive an inherited tendency for hyper production of IgE antibodies after exposure to common environmental allergens Hypersensitivity – refers to the Gell and Coombs classification for immunological diseases Intolerance is used to describe all abnormal but reproducible reactions to food when the causative mechanism is unknown Truly allergic diseases are common: about 20% of the population experience some form of allergy and this imposes a substantial physical and economic burden on the individual and society.(1)

1.2 Effect of cement on worker:

Exposure to Portland cement can occur through inhalation ingestion and eye or skin contact . Portland cement cause eye irritation and prolonged or repeated contact of the cement dust with skin cause dermatitis chronic exposure to cement dust may cause respiratory ailment in the form of cough, sputum, wheezing dyspnea, chronic bronchitis and adversely alter the pulmonary function indices.(2)

Long term contact of skin with cement result in inflammatory changes or in some cases chemical burns. Chronic exposure to wet cement damages skin , leads to chemical burning rashes on skin and inflammation.(2)

1.3 Complete blood count CBC:

Also known as: CBC; Hemogram; CBC with Differential Formal name: Complete Blood Count Related tests :Blood Smear; Hemoglobin; Hematocrit;

Red Blood Cell Count; White Blood Cell Count; WBC Differential; Platelet Count; Reticulocyte Count All content on Lab Tests Online has been reviewed and approved by our Editorial Review Board.(3)

CBC usually done to determine general health status; to screen for, diagnose, or monitor any one of a variety of diseases and conditions that affect blood cells, such as anemia, infection ,inflammation, bleeding disorder or cancer .

They are produced and mature primarily in the bone marrow and, under normal circumstances, are released into the bloodstream as needed.(3)

A standard CBC includes the following: Evaluation of white blood cells:

WBC count; may or may not include a WBC differential Evaluation of red blood cells: RBC count, hemoglobin (Hb), hematocrit (Hct)and RBC indices, which includes mean corpuscular volume (MCV), mean corpuscular hemoglobin (MCH), mean corpuscular hemoglobin concentration (MCHC), and red cell distribution width (RDW) (3).

The RBC evaluation may or may not include reticulocyte count Evaluation of platelets: platelet count; may or may not include mean platelet volume (MPV) and/or platelet distribution width (PDW) Significant abnormalities in one or more of the blood cell populations can indicate the presence of one or more conditions. (3)

The three types of cells evaluated by the CBC include:

White Blood Cells There are five different types of WBCs, also called leukocytes, that the body uses to maintain a healthy state and to fight infections or other causes of injury. They are neutrophils ,lymphocytes, basophils, eosinophils, and monocytes. They are present in the blood at relatively stable numbers. These numbers may temporarily shift higher or lower depending on what is going on in the body. For instance, an infection can stimulate the body to produce a higher number of neutrophils to fight off bacterial infection. With allergies, there may be an increased number of eosinophils. An increased number of lymphocytes may be produced with a viral infection. In certain disease states,

such as leukemia, abnormal (immature or mature) white cells rapidly multiply, increasing the WBC count.(3)

Eosinophil: These cells are similar to neutrophils, except that the cytoplasmic granules are coarser and more deeply red staining and there are rarely more than three nuclear lobes.

Eosinophil myelocytes can be recognized but earlier stages are indistinguishable from neutrophil precursors. The blood transit time for eosinophil is longer than for neutrophils. They enter inflammatory exudates and have a special role in allergic responses, defence against parasites and removal of fibrin formed during inflammation.(3)

Red Blood Cells also called erythrocytes, are produced in the bone marrow and released into the bloodstream as they mature. They contain hemoglobin, a protein that transports oxygen throughout the body. The typical lifespan of an RBC is 120 days; thus the bone marrow must continually produce new RBCs to replace those that age and disintegrate or are lost through bleeding (3).

A number of conditions can affect the production of new RBCs and/or their lifespan, in addition to those conditions that may result in significant bleeding. The CBC determines the number of RBCs and amount of hemoglobin present, the proportion of blood made up of RBCs (hematocrit), and whether the population of RBCs appears to be normal. RBCs normally are uniform with minimal variations in size and shape; however, significant variations can occur with conditions such as vitamin B12 and folate deficiencies, iron deficiency, and with a variety of other conditions. If the concentration of red blood cells and/or the amount of hemoglobin in the blood drops below normal, a person is said to have anemia and may have symptoms such as fatigue and weakness. Much less frequently, there may be too many RBCs in the blood (erythrocytosis or polycythemia).(3)

Platelets also called thrombocytes, are special cell fragments that play an important role in normal blood clotting. A person who does not have enough

platelets may be at an increased risk of excessive bleeding and bruising. An excess of platelets can cause excessive clotting or, if the platelets are not functioning properly, excessive bleeding. The CBC measures the number and size of platelets present (3)

The human hematopoietic system is extremely sensitive to some environmental influences because of rapid synthesis and destruction of cells with consequent heavy metabolic demand (4)

CBC Test:

The CBC test is the most basic blood test used in assessing allergies in people. This test simply counts the number of red and white blood cells per cubic millimeter of blood. This test can be used to check for anemia or other blood conditions and is the most basic test to assess general health in individuals. If a person suffers from asthma, a physician may check for a high level of red blood cells, or polycythemia (5).

When there is an excess amount of red blood cells, it means the individual is not receiving enough oxygen and is producing more red blood cells to try and create enough oxygen in the blood. As a blood allergy test, this test is important because high levels of white blood cells are indicative of inflammatory conditions such as allergies.(5)

Differential White Blood Cell Count A differential white blood cell count will provide physicians with a percentage of the different types of white blood cells in an individual. For example, if an individual suffers from asthma, a physician will look for a high eosinophil count, indicating a possible allergy. In extreme high levels, a person may be suffering a condition more serious than an allergy, such as a parasitic infection(5).

Allergen Specific IgE Antibody Test Immunoglobulin E, or IgE, is a protein related substance that is usually found in minute amounts in a person's blood. IgE is actually part of a normal individual's immune system and it helps to fight foreign substances that threaten one's health. As you would expect, elevated levels of IgE will alert physicians to the existence of allergies. This test can be

used when a patient has symptoms of allergies to a variety of substances. Negative results to this antibody test probably mean you don't have an allergy, which involves an IgE response by a patient's immune system. However, results of this test should be interpreted cautiously because there is a small chance that an allergy may be present even if the test results were negative. If the test does show the presence of elevated IgE antibodies, an allergy is most likely present, but we need to qualify that statement(5).

You may never have an allergic reaction to that particular substance even though you tested positive. Also, the degree of IgE antibody measured does not indicate the severity of a supposed allergy. As you can see, blood allergy tests should be interpreted with caution. We should note that the conventional method of administering the IgE antibody test has been the RAST test. More recently, most medical laboratories test for specific IgE antibodies using a more modern, immunoassay method. The PRIST test is now the most common immunoassay method used for testing the amount of IgE present in a person's blood. Radioallergosorbent Test In the 1960s, the radioallergosorbent test (RAST) was developed as an in-vitro blood allergy test (5)

1.4 Rationale:

Increase of industry activities in river Nile state pollution of environment and workers explosive to some other dust to all things that check workers safety.

This study was done to show limiting of safety in industry such as worker with suitable filter and choose suitable machine that exit few dust.

1.5 Objectives:

1-general objective :

find out and estimated allergic condition in cement factory workers .

2-specific objective:

estimated the allergic in employs factory offices.

comparison between workers closed to the cement and the distant area.

evaluated allergic condition in along time exposure.

MATERIAL AND METHODS

2.1 Study design:

Case control study.

2.2 Study area:

Workers in barber cement factory .

2.3 Samples:

A sample of 120 male workers were randomly selective from among those working at the factory, and 30 health selected subjects were randomly from college students.

2.4 Sample processing:

120 male samples was taken in subjects employed in barber cement factor , was collected from different area such as crusher, crane, backing , and 30 health selected subjects were randomly from college student.

Questionnaire 30 healthy male control include age , smoking habit, and 120 workers include age, smoking, job duration ,exposure to dust, safety, working place, hours work ,allergic condition and cough.

Blood sample was collected from vein in 5cc disposable syringe of which 2.5 ml in EDTA as an anticoagulant for the analysis of different hematological parameters by CBC mandarin machine . The various haematological parameters, such as haemoglobin (Hb) concentration, total red blood cells (TRBC) count, total white blood cells (TWBC) count, different count of WBC, platelet count, packed cell volume (PCV), mean corpuscular volume MCV), mean corpuscular haemoglobin (MCH), mean corpuscular haemoglobin concentration (MCHC), were estimated. And made thin blood film , fixed by Alcohol ,stained by Lishman stain, And seen under microscope to estimated of eosinophil to assessment of allergic condition.

2.5 Data Analysis:

The difference in means of the different groups was determined using the Student's t-test while the relationship between variables was determined using Pearson correlation coefficient. All the statistical analyses were done using the SPSS, version 17.0 and p-values less than 0.05 were considered significant.

RESULTS

Male employers in this study (100%).

The ages of the employers <20 years were (2%), while <28 years were (39.3%), and <37 years were (38.7%), while <46 years were (14%), and <55 years were (4.7%), while <73 years were (1.3%). Table (23)

Regarding to working duration in Barber cement industry found <1 years were (10.1%), while <5 years were (17.5%), and <10 years were (41.9%), while above 10 years were (2.1%), the control were (20%). Table (1)

and about place of working found that packing were (22.7%), and quality control were (1.3%), while employers were (0.7%), and safety were (1.3%), and engineer were (23.3%), about lab were (6.7%), while syndic were (2.7%), and mill were (7.3%), while produce were (4.7%), and computer were (0.7%), while oven were (2%), and CCR were (1.3%), while driving were (0.7%), and dust side were (0.7%). Table (3)

when assessing used safety in industry employers showed that less than half of employers (18.7%) have used safety. while the control were (20%) Table (4).

About hours working in Barber Cement factory found that 8h were (34%), 12h (46%), and 24h (0.7%), while control were (19.3%).

Table (2)

When assessing level of smoking between employers showed that less than half (18.7%) used smoking. While control were (20%).

Table (5)

About allergy found that less than half (12%) suffering allergy Table (6)

while cough found that less than (13.3%) half suffering cough.

Table (7)

Concerning application of blood found that WBCs were <4.000 (3.3%), and 7.000-8.000 were (66.7%), and above 8.000 were (30%). Table (8)

About lymphocyte under <20 were (0.7%), and 20-40 were (36%) while above 40.0 were (63.3%). Table(9)

Regarding eosinophil <1 were (0.7%) and 1-6 were (46%) while above 6 were (53.3%). Table(10)

about gran found that < 40.0 were (43.3%), while 40-60 were (44%), and above 60.0 were (12.7%). Table(10)

Regarding HGB <13.5 were (22%) and 13.5-17 were (62%) while above 17 were (16%). Table(12)

About RBCs < 4.500 were (33.4%), and 4.500-6.500 were (40%), and above 6.500 were (26.6%). Table(13)

About MCV <80.00 were (29.3%) while 80.00- 100.00 were (67.3%), and above 101.00 were (3.3%). Table(14)

Regarding MCH < 27.00 were (16.7%), and 27.00- 32.00 were (71.3%), while above 32.00 were (12%). Table(15)

About MCHC <31.00 were (8%), and 31.00-37.00 were (13.3%), while above 37 were (78.7%). Table(16)

About RDW.CV 11.6-14 were (52%), and above 14.00 were (47.3%). Table(17)

Regarding RDW.sd < 39.00 were (4.6%), while 39.00-46.00 were (56.7%) and above 46.00 were (38.7%). Table(18)

About Plt < 150.00 were (14.7%), and 150.00-450.00 were (84%), while above 450.00 were (1.3%). Table(20)

About MPV <8.50 were (8%), and 8.5-12.40 were (90.7%) while above 12.40 were (1.3%). Table(21)

About PDW 9.4-18.1 were (98%), and above 18.1 (2%). Table(22)

About HCT <42.00 were (12%) and 42.00- 52.00 were (77.3%) while above 52.00 were (10.7%). Table(19)

Table(1)

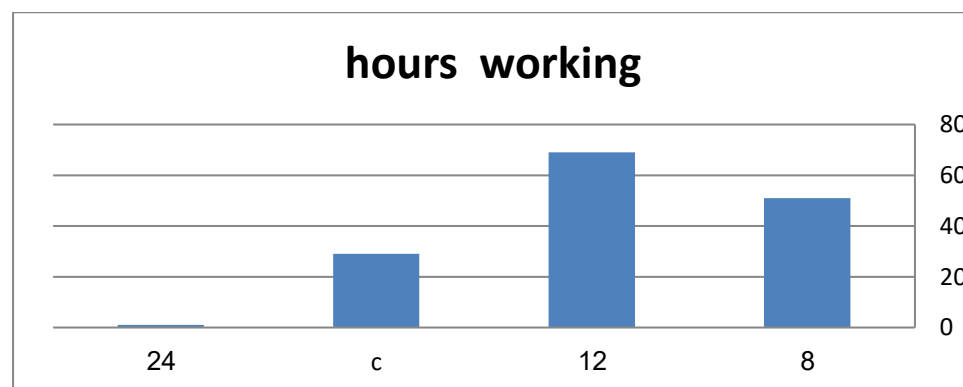
Working period

	Frequency	Percent
1	1	0.7
10y	1	0.7
12y	1	0.7
18y	1	0.7
1y	15	10
1y.6m	1	0.7
2m	4	2.7
2y	7	4.7
3m	2	1.3
3y	13	8.7
4m	3	2
4y	4	2.7
5y	19	12.7
6m	4	2.7
6y	22	14.7
7y	11	7.3
8m	1	0.7
8y	8	5.3
9y	2	1.3
Control	30	20

Table(2)

Hours working

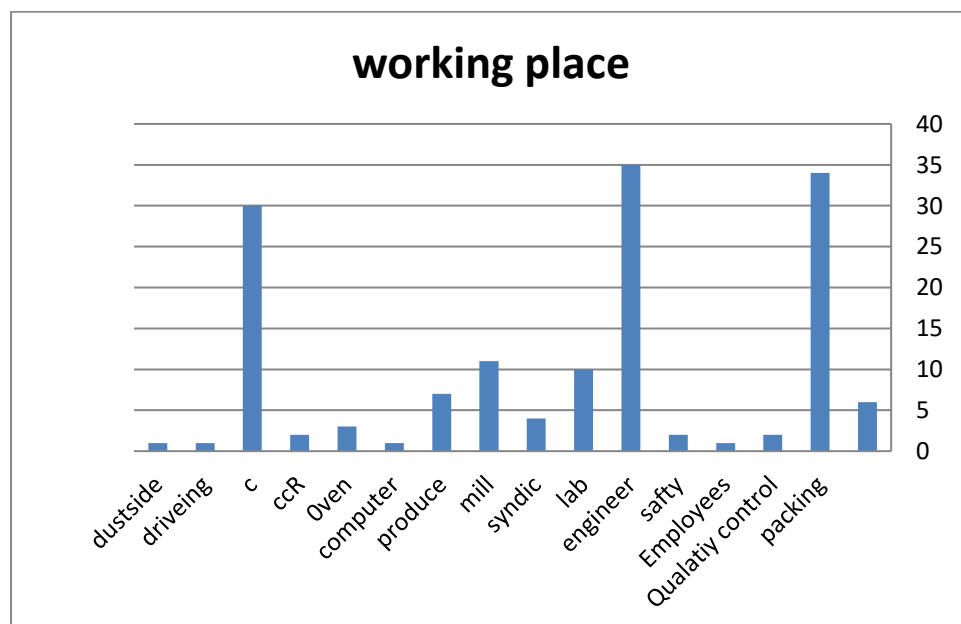
	Frequency	Percent
8	51	34
12	69	46
C	29	19.3
24	1	0.7
Total	150	100



Table(3)

Working place

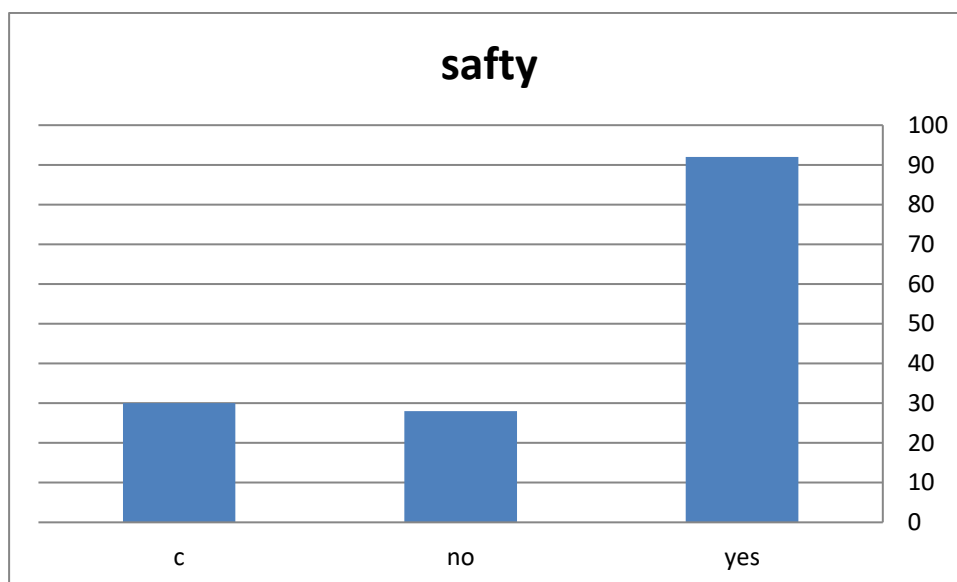
	Frequency	Percent
	6	4
Packing	34	22.7
Quality control	2	1.3
Employees	1	0.7
Safety	2	1.3
Engineer	35	23.3
Lab	10	6.7
Syndic	4	2.7
Mill	11	7.3
Produce	7	4.7
Computer	1	0.7
Oven	3	2
ccR	2	1.3
Control	30	20
Driving	1	0.7
Dust side	1	0.7
Total	150	100



Table(4)

safety

	Frequency	Percent
yes	92	61.3
no	28	18.7
c	30	20
Total	150	100



Table(5)

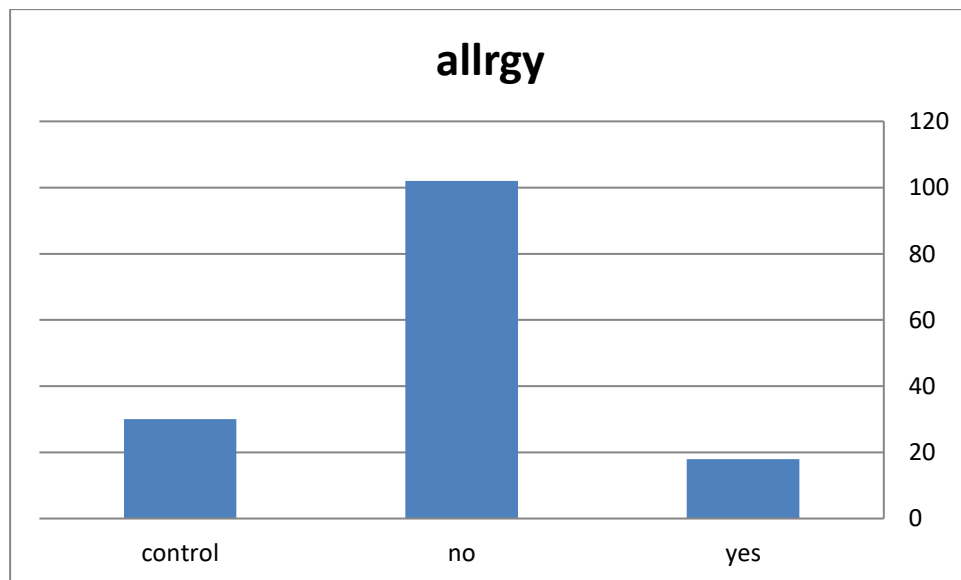
smoking

	Frequency	Percent
Yes	28	18.7
No	92	61.3
Control	30	20
Total	150	100

Table(6)

allergy

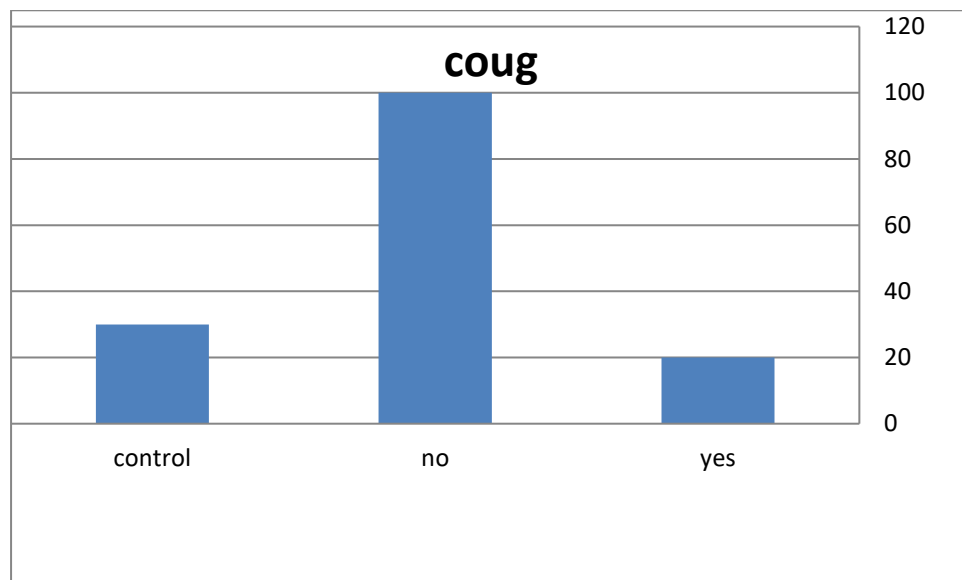
	Frequency	Percent
Yes	18	12
no	102	68
control	30	20
Total	150	100



Table(7)

cough

	Frequency	Percent
yes	20	13.3
no	100	66.7
control	30	20
Total	150	100



Table(8)

WBCs

	Frequency	Percent
<4.000	5	3.3
7.000-8.000	100	66.7
8.000+	45	30
Total	150	100

Table(9)

Lymphocyte

	Frequency	Percent
under 20.0	1	0.7
20.0 - 40.0	54	36
40.0+	95	63.3
Total	150	100

Table(10)

Esinophil

under1	1	0.7
1-6	69	46
6+	80	53.3
Total	150	100

Table (11)

Granulocyte

	Frequency	Percent
< 40.0	65	43.3
40.0 - 60.0	66	44
60.0+	19	12.7
Total	150	100

Table (12)

HGB

	Frequency	Percent
< 13.5	33	22
13.5 - 17	93	62
17.0+	24	16
Total	150	100

Table(13)

RBCs

	Frequency	Percent
under4.2	50	33.4
4.2-6-3	60	40
6.3+	40	26.6
Total	150	100

Table(14)

MCV

	Frequency	Percent
< 80.00	44	29.3
80.00 - 100.00	101	67.3
101.00+	5	3.3
Total	150	100

Table(15)

MCH

	Frequency	Percent
< 27.00	25	16.7
27.00 -32.00	107	71.3
32.00+	18	12
Total	150	100

Table(16)

MCHC

	Frequency	Percent
< 31.00	12	8
32.00 - 37.00	20	13.3
34.00+	118	78.7
Total	150	100

Table(17)

RDW.cv

	Frequency	Percent
11.60 - 14.00	78	52
14.00+	72	48
Total	150	100

Table(18)

RDW.sd

	Frequency	Percent
< 39.00	7	4.6
39.00 - 46.00	85	56.7
46.00+	58	38.7
Total	150	100

Table (19)

HCT

	Frequency	Percent
< 37.00	18	12
42.00 - 52.00	116	77.3
52.00+	16	10.7
Total	150	100

Table (20)

PLT

	Frequency	Percent
< 140.00	22	14.7
150.00 -4500.00	126	84
450.00+	2	1.3
Total	150	100

Table(21)

M pv

	Frequency	Percent
< 8.5	12	8
8.5 - 12.4	136	90.7
12.4	2	1.3
Total	150	100

Table (22)

PDW

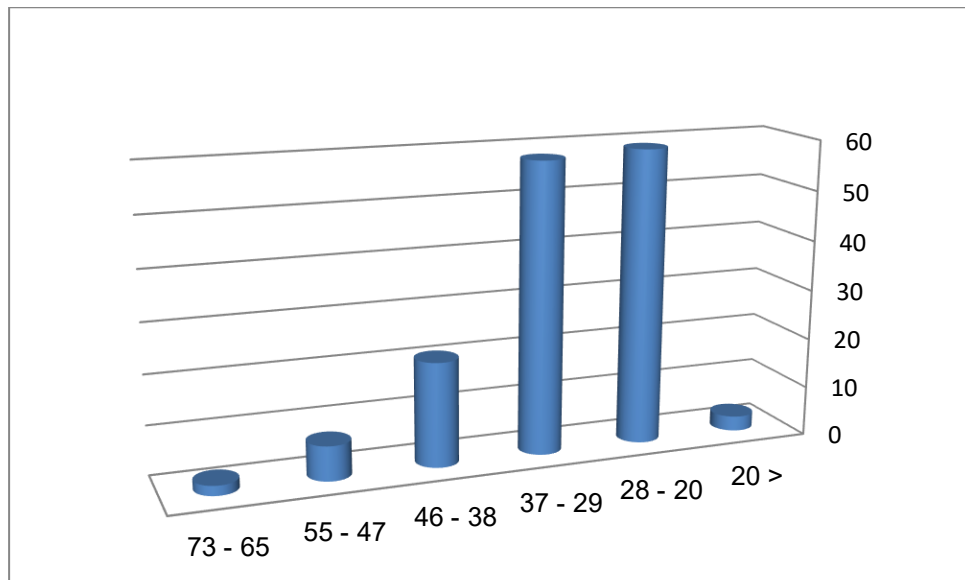
	Frequency	Percent
9.4 - 18.1	147	98
18.1+	3	2
Total	150	100

Table (23)

Age distribution

	Frequency	Percent
< 20	3	2
20 – 28	59	39.3
29 – 37	58	38.7
38 – 46	21	14
47 – 55	7	4.7
65 – 73	2	1.3
Total	150	100

Age distribution



Discussion

Our study show that the mean concentration of the crusher personal total dust exposure in the raw mills ,packaging area and kiln are more exposure to dust that make suffering from allergy than other workers .after hematological parameter to analysis ,Esinophil is high in both smoker and non smoker . workers of present study this finding agree with Divya Priya and Suja (6). increase in eosinophil count has been found in both smoker and non-smoker workers of higher and lower age group. This raised level of eosinophils has been associated with allergic response responses (7). Significantly higher number of eosinophils has been reported in patients positive for nerve growth factor which plays an important role in allergies and respiratory diseases (8,9) Our study shown decrease granulocyte count , increase lymphocyte count among WBCs , this significant increase in WBCs count among smoker and non smoker.this finding agree with Ali (10) and Nieters et al. (11) smoker construction workers show significantly ($p<0.01$) decreased neutrophil count and significantly ($p<0.01$) increased lymphocyte count among WBC, this significant decrease in WBC count among smoker and nonsmoker may be attributed to the agonist action of smoking with cement dust, toxic metal exposure and exposure to voc paints. High MCH level in smoker than non smoker construction workers indicates an additive effect of smoking on hematopoietic system.

Our study show decrease pattern of hemoglobin concentration , PCV and platelet count ,this finding agree with Mojiminiyi et al. (12) found a decreasing pattern of haemoglobin concentration, PCV and total WBC count and increasing pattern of platelet count with a year of exposure among Nigerian cement factory workers These differences might be due to very low sample size of Nigerian workers in comparison to our study A study involving 36 – 65 years of exposure to cement dust might bring out significant haematological changes, as suggested by Guguloth et al. (13).

Again, Redlich (14) reported that various occupational exposures cause lung injury and initiate a chronic inflammatory process that may either progress to initiate fibrosis or result in repair. Alternatively, chronic exposure to irritating material might lead to adaptation process, which resists. Percentage of prevalence of anemia Haemoglobin, construction workers, control, PCV, Prog Health Sci 2014, Vol 4, No1 Haematological changes among construction workers of India inflammation and leukocytosis. . Hanser et al. (15) suggested that adaptation process, to a certain extent may be responsible for the non significant rise in total WBC count with regard to the period of exposure. From the study, it can be concluded that construction workers exposed to cement dust, silica and other toxic substance showed significant haematological changes (haemoglobin, PCV, MCV and high prevalence of anaemia which indicated toxicant contamination of working environment). As such in order to prevent the development of malignant diseases, periodic CBC test is required to detect the diseases in early stage.

Conclusion :.

There is a variation in the haematological profile in subjects having allergic disorders. Therefore routine blood investigations should be made mandatory in all allergic conditions even with minimal or no symptoms which will further help in the early diagnosis and treatment

Recommendation

Regarding to the study we recommended the following:

Replace the workers from place to place after each six months.

Reducing the number of hours working .

Provide meal to improve the immunity of workers .

Interval the holyday between the months.

Must any person in factory take your holyday.

References

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