Comparisons and Differential of Total Leukocytes Count among the Dermatitis Patients at Naseerullah Khan Babar Hospital, Peshawar

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Abstract

Background: Dermatitis, also known as eczema, is a chronic inflammatory skin disease characterized by eczematous skin inflammation. Dermatitis is characterized by itching, red skin and a rash. Dermatitis is distributed worldwidly. Treatment and management option of dermatitis include antifungal drugs, antihistamine drugs, steroids and phototherapy.

Objectives: To asses and compare the TLC and DLC status among the dermatitis patients at Naseerullah Khan Babar Hospital, Peshawar.A secondary objective is to determine whether which type of leukocyte is affect with dermatitis disease.

Method: We hadsearched the following data from November to December 2017. Dermatitis patients were the targeted population for data collection. The data collection from the dermatitis patients was collected through convenience sampling technique. The sample size of the study was four hundred and twenty four (424) patients present to dermatology unit at Naseerullah Khan Babar hospital Peshawar.

Result: The mean age of dermatitis patients which have presented to the dermatology department at Naseerullah khan Baber hospital Peshawar is 29.7 years. This study also gives facts about gender of the dermatitis patients in which there are 54.2% female and 46.8% male patients the ratio of female dermatitis patients are high from male. The TLC status is below from normal range in 1.7% patients, TLC with normal status 74.85% and TLC status is high in 23.6% patients. DLC status mostly neutrophils and lymphocytes are affected and the remaining eosinophils, monocytes and basophils are not so affected.

Conclusion: This study concluded that TLC of patients is not so increase as expected.TLC is mostly remains normal in dermatitis patients There were only some patients TLCs are high and very rarely TLC is low in dermatitis patients. While the DLC of dermatitis patients there are only neutrophils and lymphocytes are mostly affected , remaining leukocytes such as eosinophils, monocytes and basophils are not so affected due to dermatitis.

1. INTRODUCTION

Dermatitis is a group of diseases that results in inflammation of the skin. These diseases are characterized by itches, red skin, and rashes. In cases of short duration there may be small blisters while in long-term cases the skin may become thickened. The area of skin involved can vary from small to the entire body (1). It includes atopic dermatitis, allergic contact dermatitis, irritant contact dermatitis, and stasis dermatitis. Although the etiology and pathogenesis of dermatitis remain unknown, some evidences have suggested that genetic predisposition such as defect of filaggrin synthesis and environmental factors such as allergen exposure contribute to the formation of dermatitis (2). Three stages are proposed including infantile dermatitis, childhood dermatitis, and adolescent/adult dermatitis. The type of dermatitis is generally determined by the person's history and the location of the rash. For example, irritant dermatitis often occurs on the hands of people who frequently get them wet. Allergic contact dermatitis occurs upon exposure to an allergen causing a hypersensitivity reaction in the skin(3). Dermatitis occurs most frequently in children, but also affects many adults. It is common and diverse, ranging from acne to life-threatening melanoma (4). In the Asian subcontinent, the presence of various socio-religious and cultural practices along with widespread use of complementary and alternative medicine frequently result in a host of secondary dermatitis (5). Dermatitis is a wide-spread health problem among people though not responsible usually for mortalities but mostly for morbidities. It has been neglected both by the community and health personnel. A number of studies have been conducted to understand the skin problems in population which have recorded wide ranging prevalence and patterns(6).
White blood cells (WBCs), also called leukocytes or leucocytes, are the cells of the immune system that are involved in protecting the body against both infectious disease and foreign invaders. All white blood cells are produced and derived from multipotent cells in the bone marrow known as hematopoietic stem cells. Leukocytes are found throughout the body, including the blood and lymphatic system(7).All white blood cells have nuclei, which distinguishes them from the other blood cells i-e RBCs and platelets. Types of white blood cells can be classified by two pairs of broadest categories classify them either by structure granulocytes or agranulocytes or by celldivision lineage myeloid cells or lymphoid cells. These types are distinguished by their physical and functional characteristics. Monocytes and neutrophils are phagocytic. Further subtypes can be classified, for example lymphocytes, there are B-cells, T-cells, and NK cells (4). The number of leukocytes in the blood is often an indicator of disease, and thus the WBC count is an important subset of the complete blood count. The normal white cell count is usually between

4×10^9/L and 11×10^9/L. In the United State this is usually expressed as 4,000 to 11,000 white blood cells per microliter of blood (8).They make up approximately 1% of the total blood volume in a healthy adult, making them substantially less numerous than the RBCs at 40% to 45%. However, this 1% of the blood makes a large difference to health, because immunity depends on it. An increase in the number of leukocytes over the upper limits is called leukocytosis. It is normal when it is part of healthy immune responses, which happen frequently. It is occasionally abnormal, when it is neoplastic or autoimmune in origin. A decrease below the lower limit is called leukopenia. This indicates a weakened immune system (9).

2. MATERIALS AND METHODS

2.1 Study design and setting
The research study design is the descriptive cross-sectional study. This research project is a comparative study in which there is a comparison of total leukocyte count and differential leukocyte count of dermatitis patients.The study setting is Naseerullah Khan Babar hospital Peshawar. So the participants in this research project from whom the data is collected are those patients who are presented to the dermatologist at Naseerullah Khan Babar hospital Peshawar.

2.2 Study population
Data was collected from November to December 2017 in duration of two months. Dermatitis patients were the targeted population for data collection. The data collection from the dermatitis patients was collected through convenience sampling technique. The sample size of the study was four hundred and twenty four (424) patients present at dermatology unit at Naseerullah Khan Babar hospital Peshawar.

2.3 Ethical Consideration
All the ethical issues were discussed thoroughly with the concerned person and after thorough discussion all the necessary measures were taken accordingly. After getting permission from the concerned department at Naseerullah Khan Babar Hospital, Peshawar data from the research participants was collected according to the proper protocol.

2.4 Comparison of TLC
For the comparison of total leukocyte count and differential leukocyte count dermatitis patient's blood samples were collected to analyze their TLC and DLC parameters. To avoid the patient's blood from coagulation and from other chemical and morphological changes in blood cells the collected blood sample was put in a specialized anticoagulant tube (EDTA tube). Then for the further process, hematology analyzer was used which gave us the detail hemogram of the patient blood from which we analyzed the TLC and DLC values of dermatitis patients.

2.5 Statistical Analysis
The TLC and DLC data of patients was analyzed by Statistical Package for Social Sciences (SPSS) version 22.

3.   Results and Discussion

3.1 Age and Gender wise comparison of dermatitis patients

The below table 1. shows age wise categories of dermatitis patients. The toddler patients having age from 1-2 years are 4.2%, play age patients having age from 3-6 years are 5%,Pre-school patients having age 6-12 years are 5.7%, adolescence patients having age 12-20 years are 14.6%, young adult patients having age from 20-40 years are 40% this group of age maximum affected as compared to the other group of ages. The middle adult patients having age from 40-60 years are 24.3% and the old age patients having age from 60-80 years are 5.4%.

Table 1. Age and gender, wise distribution of patients**.**

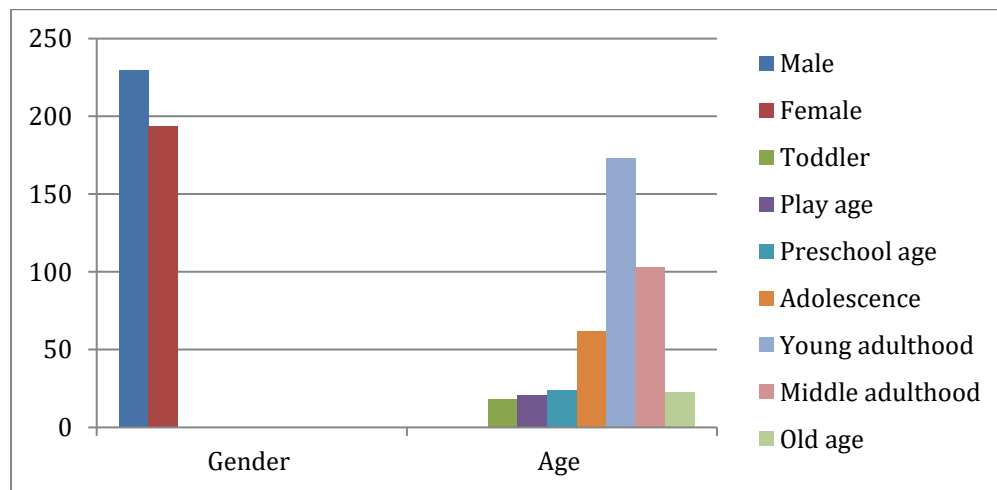|		Count	Table Valid N %
Gender of the patient	Female	230	54.2%
	Male	194	45.8%
Age of the patient	Toddler	18	4.2%
	Play age	21	5.0%
	Preschool age	24	5.7%
	Adolescence	62	14.6%
	Young adulthood	173	40.8%
	Middle adulthood	103	24.3%
	Old age	23	5.4%

Figure 1. Age and Gender comparison of dermatitis patients.

3.2 TLC status gender wise in total number of patients

The below chart and table 2. Shows that the TLC of dermatitis patients decreases in 7 patients in whom there are 3 female and 4 male patients, there are 317 dermatitis patients having normal TLC in whom 172 are female and 145 are male while the patients having increased TLC are 55 female patients and 45 are male.

Table 2. TLC status gender wise in total number of patients

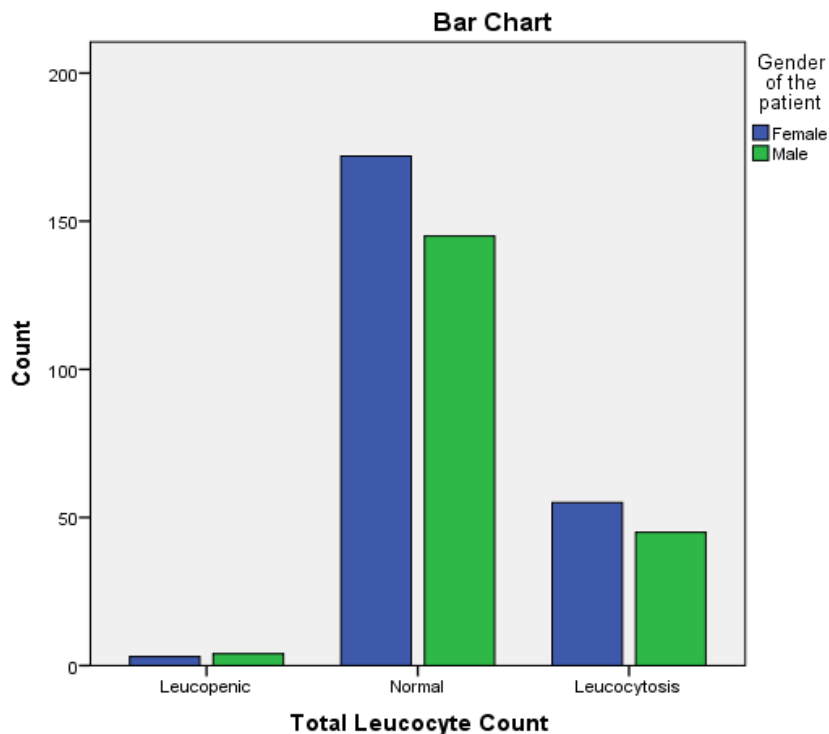| Lymphocyte status		Gender of the patient		Total
		Female	Male	
	Lymphocytopenia	24	40	64
	Normal	197	148	345
	Lymphocytophilia	9	6	15
Total		230	194	424

Figure 2. TLC status gender wise in total number of patients

3.3 Neutrophil status gender wise in total number of patients
The Below chart and table 3. shows the neutrophilic status on gender base through cross tabulation. In the above chart and table the neutrophil count is decreased in 5 patients among whom there are 4 male patients and only one patient is female. The patients having normal neutrophil count are 302 in which there are 176 female patients and 126 are male patients. There are 117 patients having increased level of neutrophil count in which 53 are female and 64 are male patients.

Table 3. Neutrophil status gender wise in total number of patients

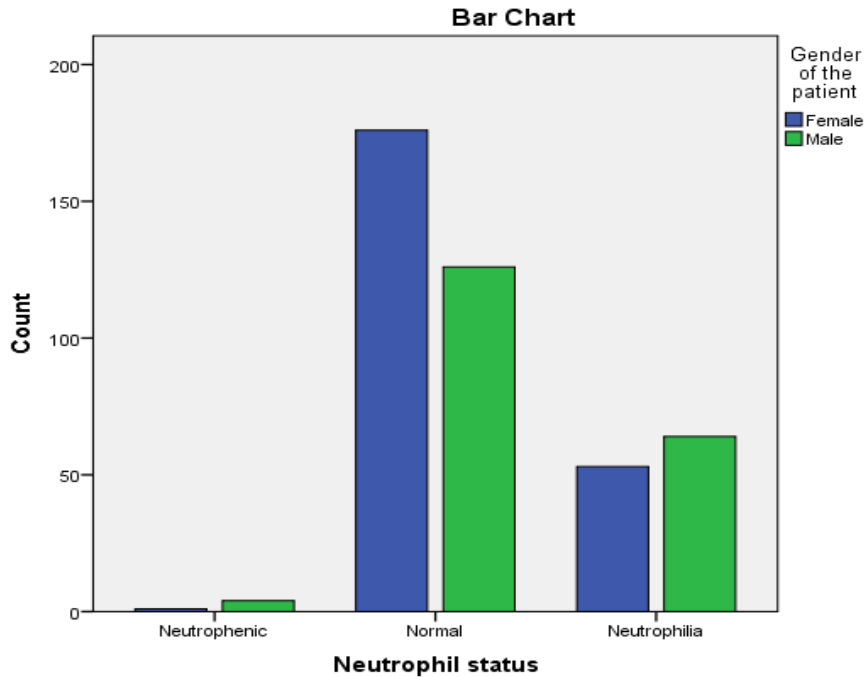| Neutrophil status	Gender of the patient		Total
	Female	Male	
Neutropenia	1	4	5
Normal	176	126	302
Neutrophilia	53	64	117
Total	230	194	424

Figure 3. Neutrophil status gender wise in total number of patients

3.4 Lymphocyte status gender wise in total number of patients
The Below chart and table 4. shows the lymphocytic status of patients on genderbase through cross tabulation. In the above table there are 64 patients having lymphopenic condition means they decrease level of lymphocyte from normal in which 24 female and 40 male patients. The patients having normal lymphocyte count are 345 in which 197 are female and 148 are male patients. The patients having increased level of lymphocytes are 15 in which 9 are female patients and 6 are male patients.

Table 4. Lymphocyte status gender wise in total number of patients

Lymphocyte status	Gender of the patient		Total
	Female	Male	
Lymphocytopenia	24	40	64
Normal	197	148	345

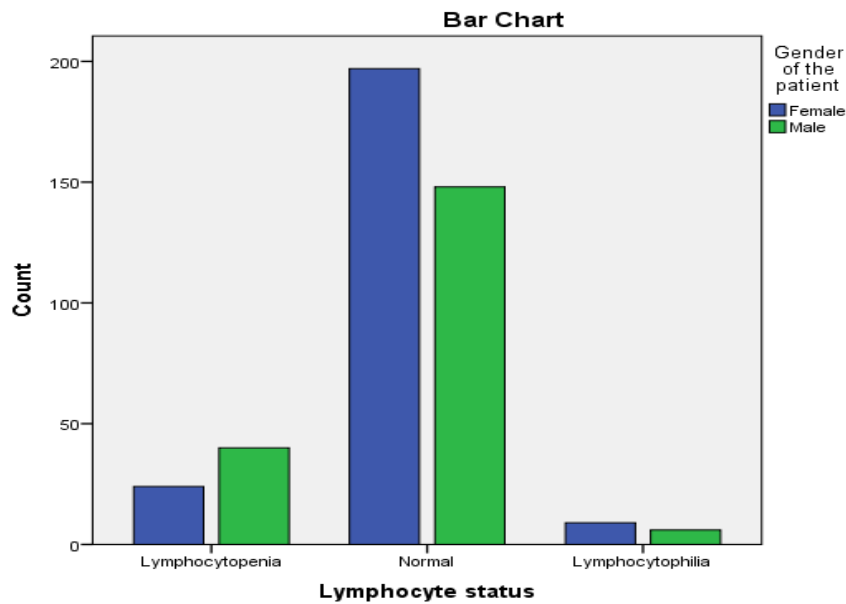|	Lymphocytophilia	9	6	15
Total		230	194	424

Figure 4. Lymphocyte status gender wise in total number of patients

3.5 Eosinophil status gender wise in total number of patients

The below 5. Chart and table shows the eosinophilic status on gender base through cross tabulation. There are 52 patients having eosinophilic condition means decrease eosinophil from normal range in which there are 26 male and female each has decreased eosinophil level. Normal eosinophil count patients are 363 in which 198 are female and 165 male patients. The patients having increased level of eosinophil count are 9 in which 6 female and 3 male patients.

Table 5. Eosinophil status gender wise in total number of patients

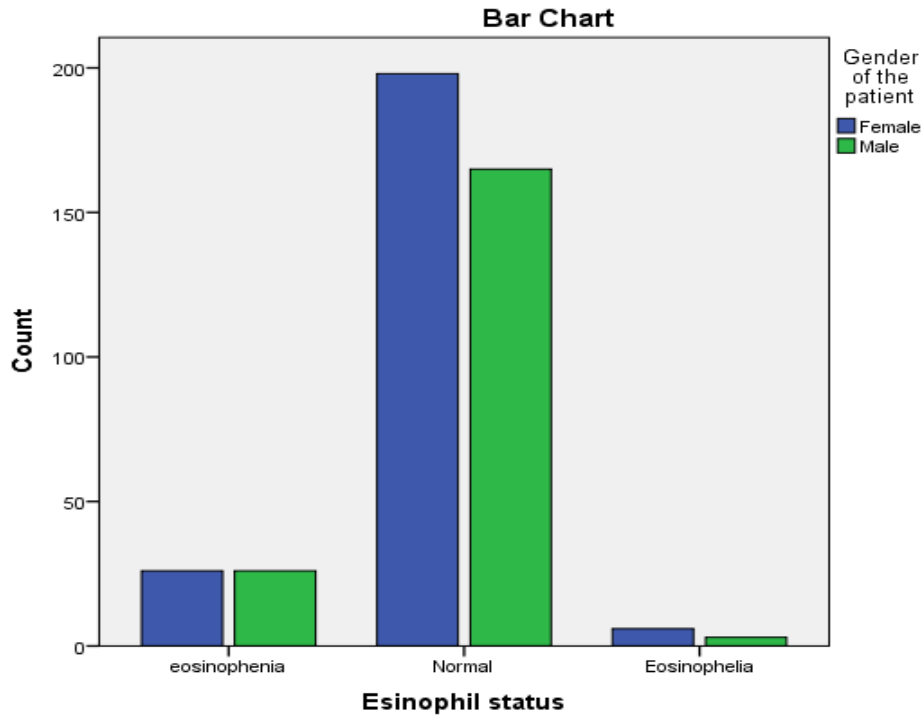| Eosinophil status	Gender of the patient		Total
	Female	Male	
Eosinophenia	26	26	52
Normal	198	165	363
Eosinophilia	6	3	9
Total	230	194	424

Figure 5. Eosinophil status gender wise in total number of patients

3.6 Monocyte status gender wise in total number of patients

The Below chart and table 3.8 shows the monocyte status on gender base through cross tabulation. There are 114 patients having decreased level of monocytes count in which there are 52 female and 62 male patients. The patients having normal monocytes count are 307 in which 177 female and 130 male patients. The patients having increased level of monocytes count are 3 in which 2 are female and 1 is male patient

Table 6. Monocyte status gender wise in total number of patients

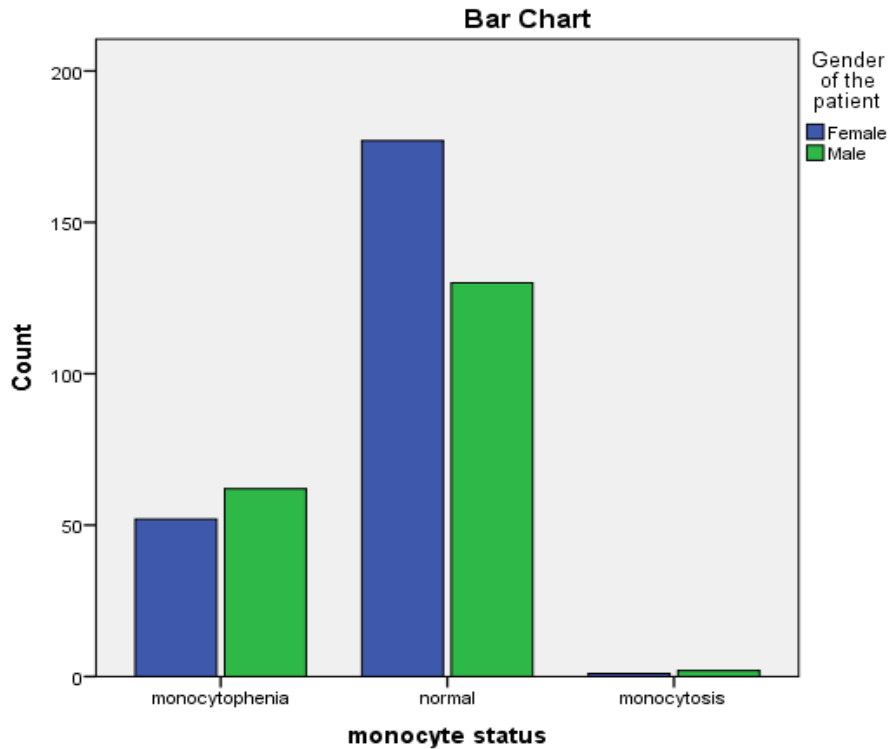| Monocyte status	Gender of the patient		Total
	Female	Male	
Monocytophenia	52	62	114
Normal	177	130	307
Monocytosis	1	2	3
Total	230	194	424

Figure 6. Monocyte status gender wise in total number of patients

3.7 Basophil status gender wise in total number of patients.
The Below chart and table 3.9 shows the basophil status on gender base through cross tabulation. The chart and table shows that the dermatitis has noeffect on the basophil count, thus the entire 424 patient male and female both having normal basophil count**.**

Table 7. Basophil status gender wise in total number of patients.

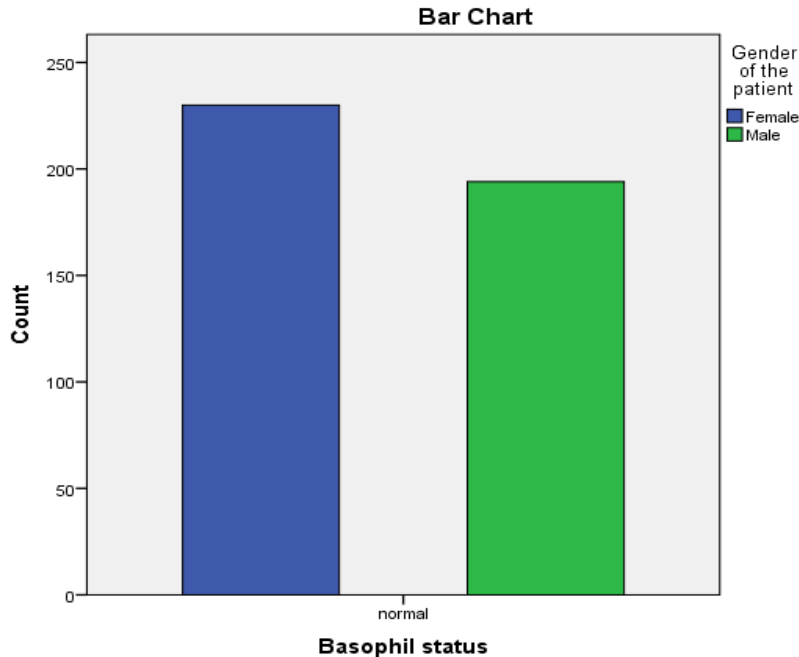| Basophil status	Gender of the patient		Total
	Female	Male	
normal	230	194	424
Total	230	194	424

Figure 7. Basophil status gender wise in total number of patients.

4. CONCLUSION

This study concluded that TLC of patients is not so increased as expected. There are only 23.6% of patients whose TLC is high and very rarely TLC is low in dermatitis patients. TLC mostly remains normal in 74.8%.In DLC of dermatitis only neutrophil and lymphocytes are mostly affected. Neutrophils are increased in 27.6% and 71.2% remains normal while lymphocyte count is decreased in 15.1% of dermatitis patients and mostly normal while rarely increases the lymphocyte count which is 3.5%. The mean age of dermatitis patients who have been presented to the dermatology department at Naseerullah khan Baber hospital Peshawar is 29.7 years. This study also gives facts about the gender of the dermatitis patients in which there are 54.2% female and 46.8% male patients the ratio of female dermatitis patients is high as compared to male because they have more sensitive skin and also usage of different cosmetic material.

5. RECOMMENDATION

Longitudinal studies should be conducted to provide the picture of the current topic.Sample size should be large for the comparison of TLC and DLC in dermatitis patients.There should beawareness about different types of dermatitis from which the patient suffering.
There should be absolute DLC values instead of DLC values.

5. REFERENCES

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