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Intramuscular Drug Administration At A Local Hospital In Kosovo

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Abstract – Introduction : Medicines are administered in two ways: locally and systemically. Creams, ointments, various fats that contain active substances are included in the drugs administrated locally, while systematically are drugs that enter the human body via enteral and parenteral routes. The parenteral route is the injection of drugs into different parts of the body by means of syringes. The methods of administration are : subcutaneous (under the skin), intravenous (in the veins) and intramuscular (in the muscles). There is a variety of the drugs which can be administrated in different routes, depending on the form of the drug, however some of the drugs are preferred to be administrated intramuscularly.

Aim: In this article we aim to identify the drugs most used intramuscularly in a local hospital in Kosovo during the period January-December 2021.

Methods : In this study we have collected data from a family medical center in a city in Kosovo. The data collected were on patients treated intramuscularly only and the therapy used for the period January-December 2021. All patients' data were obtained from protocol books of the treated patients and all the data were analyzed separately each month. A total of 1908 patients treated were enrolled in the study. As demographic characteristic, the gender of the patients represented by numbers and percentage was included in the study. In every sector we have presented the percentage of the therapy used through intramuscular route of administration.

Results: Based on the review of the relevant literature and the analysis of the protocols at the Center of Family Medicine in a local hospital in Kosovo, this research paper reveals data as follows: In the period January-December 2021, a total of 1908 patients were treated. Of them, 884 were male and 1024 were female. The most frequent therapy was: Ceftriaxone, Dexamethasone, Diclofenac and Diazepam.

Conclusion: Taken together, these data have shown a higher use of mainly four drugs such as Diclofenac, Dexamethasone, Ceftriaxone and Diazepam. And the period which was characterized with a higher number of patients needed to be treated with the above-mentioned therapy was during winter season.

Keywords – drugs, intramuscular administration, therapy

I. INTRODUCTION

Drug treatment aims to deliver drugs to the place where it needs to act. Drug is defined as any substance that has a medicinal effect. The medicine enters the body (administration process) sometimes even far from the place where it intends to act. The medication passes into the blood circulation system, and by means of the blood it is transported to the places where its action is needed (Cafasso, 2022). Depending on the type or chemical composition of the drug, some may be chemically changed (metabolizing process) by the human body before they show effect, others may be metabolized after their action, and some are not metabolized (Cafasso, 2022).

Medicines are administered in two ways: locally and systemically. Creams, ointments, various fats that contain active substances are included in the drugs administrated locally, while systematically are drugs that enter the human body via enteral and parenteral routes (Stan K. Bardal, 2011).

The enteral route is one of the most used and simplest form of drug administration, and it includes the gastrointestinal tract starting from mouth followed by esophagus, stomach and intestines. The methods of administration are oral (by mouth), sublingual (under the tongue) and rectal (Stan K. Bardal, 2011).

The parenteral route is the injection of drugs into different parts of the body by means of syringes. The methods of administration are : subcutaneous (under the skin), intravenous (in the veins) and intramuscular (in the muscles) (Lee, 2020)

However, to administrate drugs intramuscularly, caution must be taken in the right form of the drugs and solvents. Sterile solutions in small glass bottles or ampoules should be used. The solutions should be water, oil or suspensions of medicinal substances in water or oil. Medicines that are not stable in liquid form are stored in powder form which are dissolved before use. (Bahtiri, 2006).

Moreover, drugs that are administered intramuscularly should not be irritating to the muscles, such drugs should be administered slowly, and the site of administration should be rotated.

There is a variety of the drugs which can be administrated in different routes, depending on the form of the drug, however some of the drugs are preferred to be administrated intramuscularly.

II. Aim Of The Study

In this article we aim to identify the drugs most used intramuscularly in a local hospital in Kosovo during the period January-December 2021.

III. Materials And Methods

In this study we have collected data from a family medical center in a city in Kosovo. The data collected were on patients treated intramuscularly only and the therapy used for the period January-December 2021. All patients' data were obtained from protocol books of the treated patients and all the data were analyzed separately each month.

A total of 1908 patients treated were enrolled in the study. As demographic characteristic, the gender of the patients represented by numbers and percentage was included in the study.

In every sector we have presented the percentage of the therapy used through intramuscular route of administration.

IV. Results

4.1. Presentation of the results for the month of January

In this sector, the patients treated in the month of January will be presented, which were a total of 184, of which 84 (45.6%) were male and the majority of them, 100 (54.3%) were female (Fig 1). While in the data collected in the use of the drugs as therapy in the month of January, Diclofenac was the durg most frequently used with 21%, followed by Dexamethasone with 20%, Ceftriaxone with 18%, and Diazepam with 10%. Other drugs used in a smaller rate were : Methylprednisolone with 8%, Ketorolac and Thiocolchicoside with 5%, Gentamicin, Furosemide and Metamizole with 3%, Ranitidine with 2% and Fraxiparine and Penicillin with 1% (Fig 2)

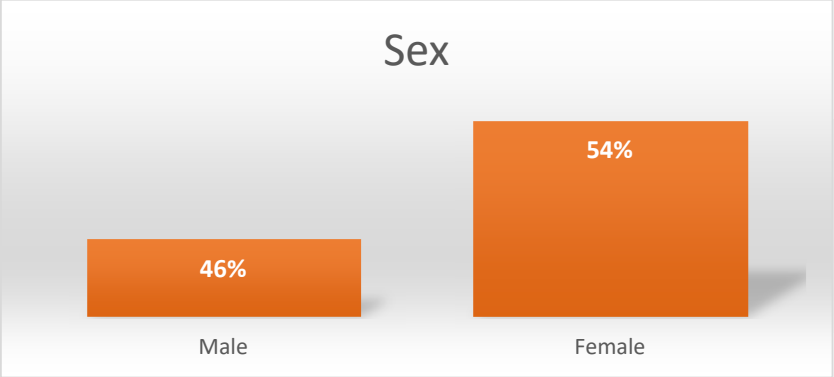

Figure 1: Presentation in percentage by sex for the month of January.

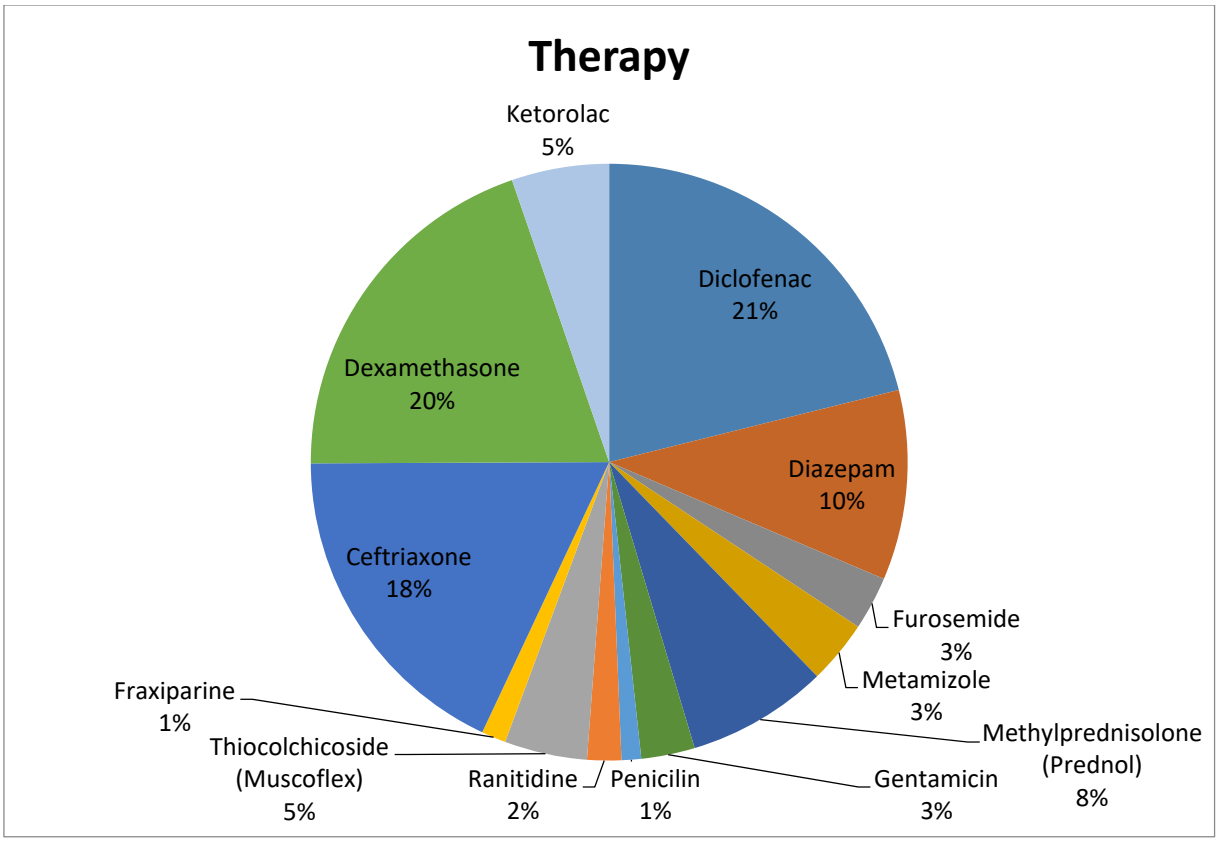

Figure 2: Presentation of therapy in percentage for the month of January.

4.2. Presentation of the results for the month of February

In this sector, the patients treated in the month of February are presented, which totaled 162, of which 88 (54.3%) were male and 74 (45.7%) were female (Fig 3). When evaluating the therapy used, we could see a higher usage of Diclofenac with 25% which was almost similar with the use of Dexamethasone with 24%. Again, followed by Ceftriaxone and Diazepam with 16% and 10% respectively. While those used less were as follow: Ketorolac, Penicilin and Metamizole with 4%, Furosemide with 3%, Thiocolchicoside and Ranitidine with 2% and Metoclopramide with 1%. (Fig 4)

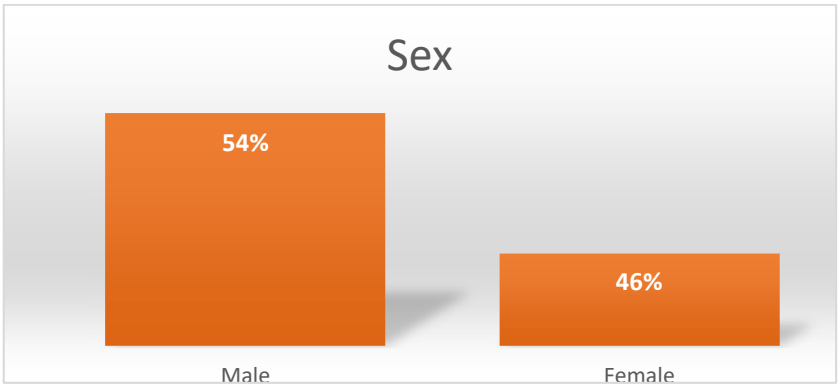

Figure 3 : Presentation in percentage by sex for the month of February.

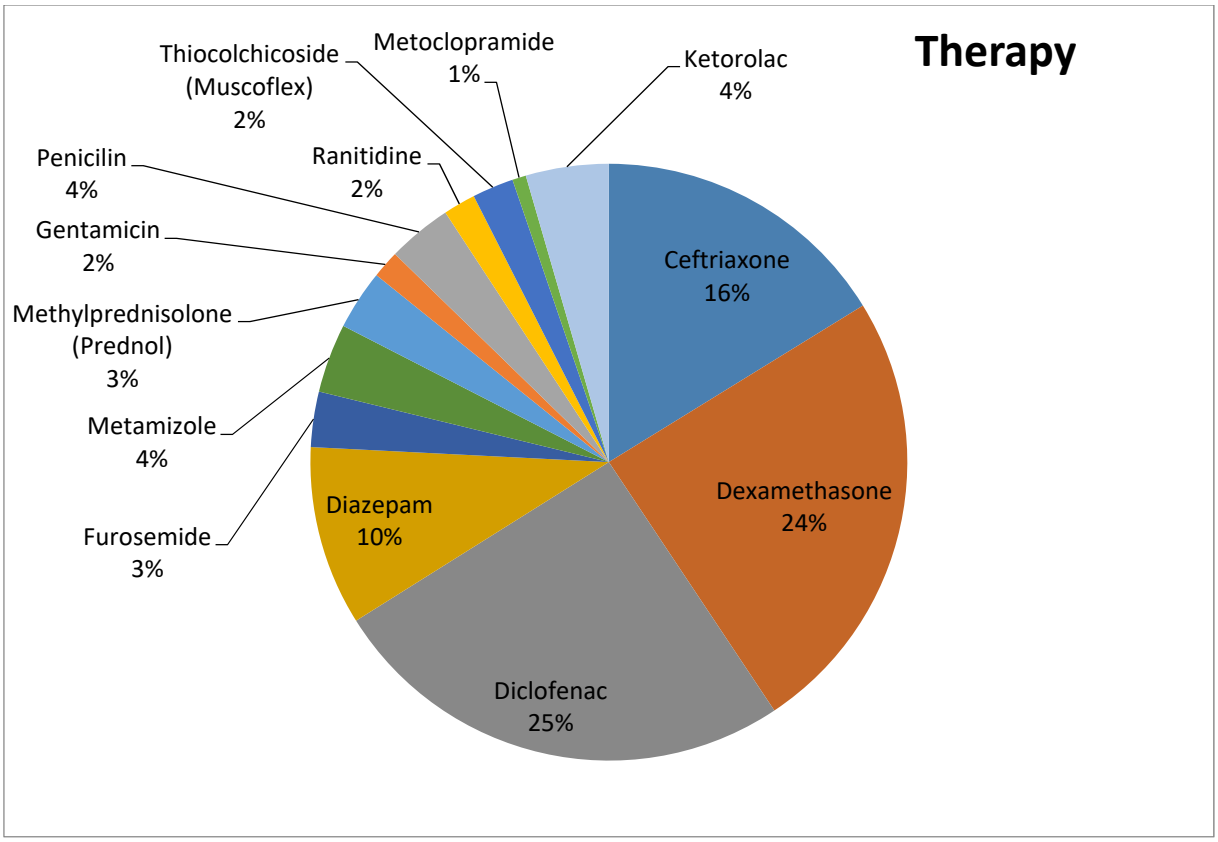

Figure 4: Presentation of therapy in percentage for the month of February.

4.3. Presentation of the results for the month of March

In this sector, the patients treated in the month of March will be presented, which totaled 165, of which 77 (46.66%) were male and 88 (53.33%) were female (Fig 5)

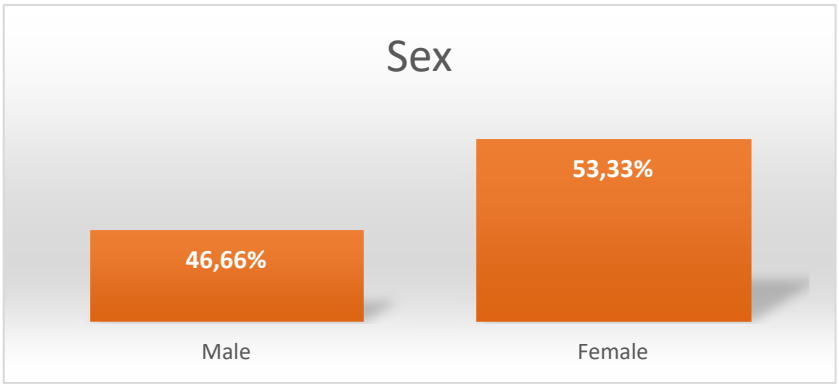

Figure 5 : Presentation in percentage by sex for the month of March.

We again evaluated the therapy used in the next month, March of 2021, and we again noticed the same trend with Diclofenac and Dexamethasone being the most used ones, 22 % and 21% respectively. While those used less were as follow: Ketorolac, Penicillin and Metamizole with 4%, Furosemide with 3%, Thiocolchicoside and Ranitidine with 2% and Metoclopramide with 1% (Fig 6)

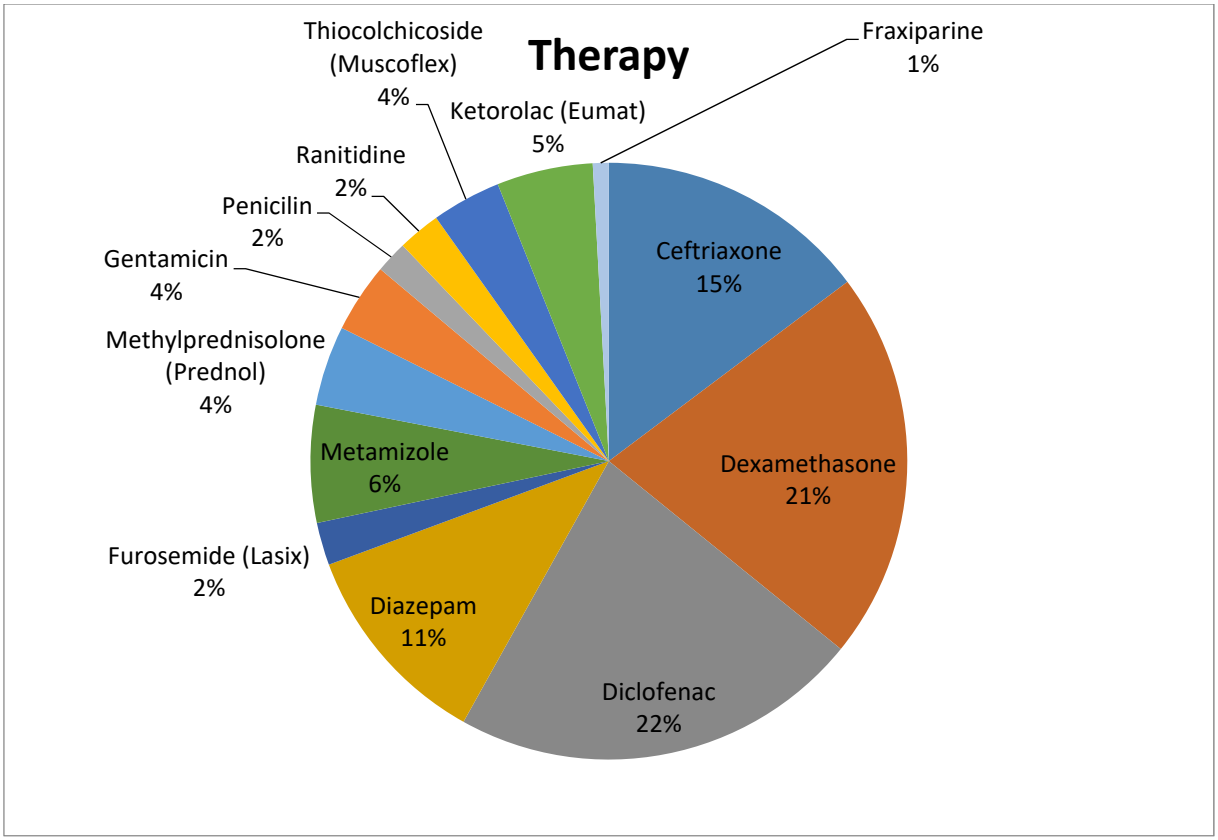

Figure 6: Presentation of therapy in percentage for the month of March.

4.4. Presentation of the results for the month of April

During April, a total of 121 patients were treated, of which 57 (47.10%) were male and 62 (52.9 %) were female (Fig 7). When evaluating the therapy used, we could see a higher usage of Dexamethasone with 23% followed by Diclofenac with 21% and Ceftriaxone and Diazepam with 16% and 11% respectively. Again, the other drugs used in a smaller scale were: Ketorolac, Penicillin and Metamizole, Furosemide, Thiocolchicoside and Ranitidine and Metoclopramide (Fig 8)

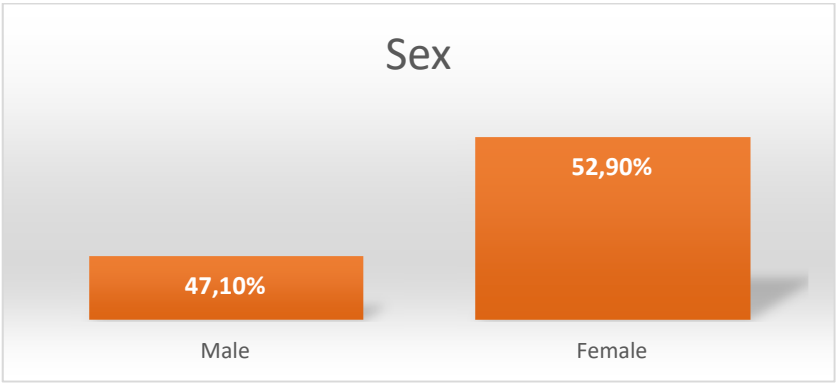

Figure 7 : Presentation in percentage by sex for the month of April.

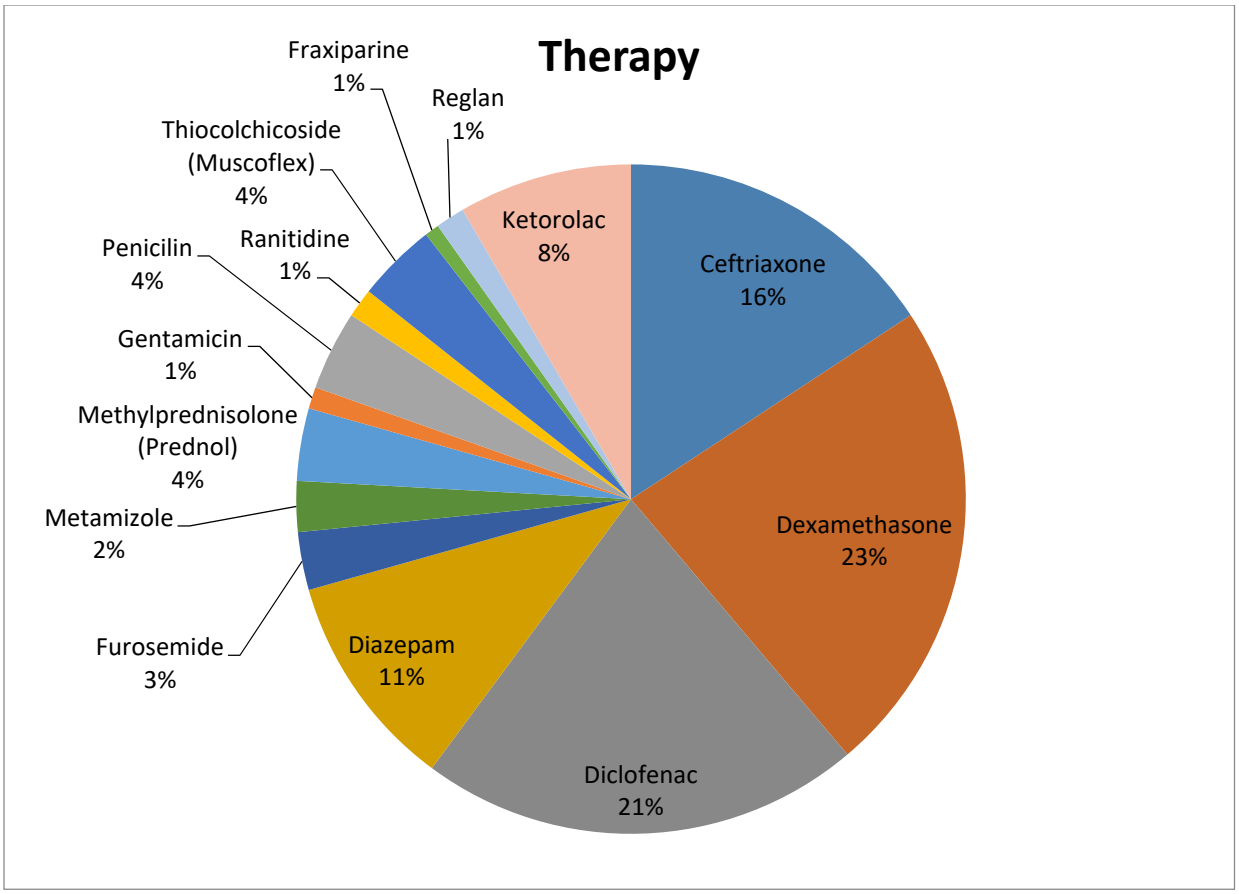

Figure 8: Presentation of therapy in percentage for the month of April.

4.5. Presentation of the results for the month of May

In this sector, the patients treated in the month of June will be presented, which totaled 131, of which 63 (47.3%) were male and 69 (52.7%) were female (Fig 9)

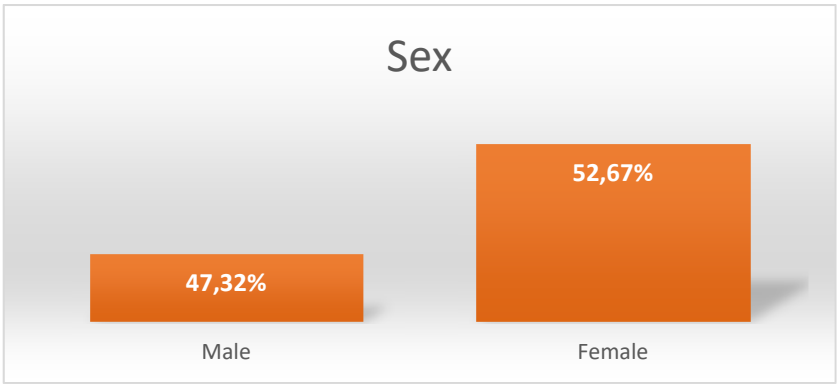

Figure 9 : Presentation in percentage by sex for the month of May.

We again evaluated the therapy used in the next month, March of 2021, and we again noticed the same trend with Diclofenac and Dexamethasone being the most used ones, 22 % and 21% respectively. While those used less were as follow: Ketorolac, Penicilin and Metamizole with 4%, Furosemide with 3%, Thiocolchicoside and Ranitidine with 2% and Metoclopramide with 1% (Fig 10)

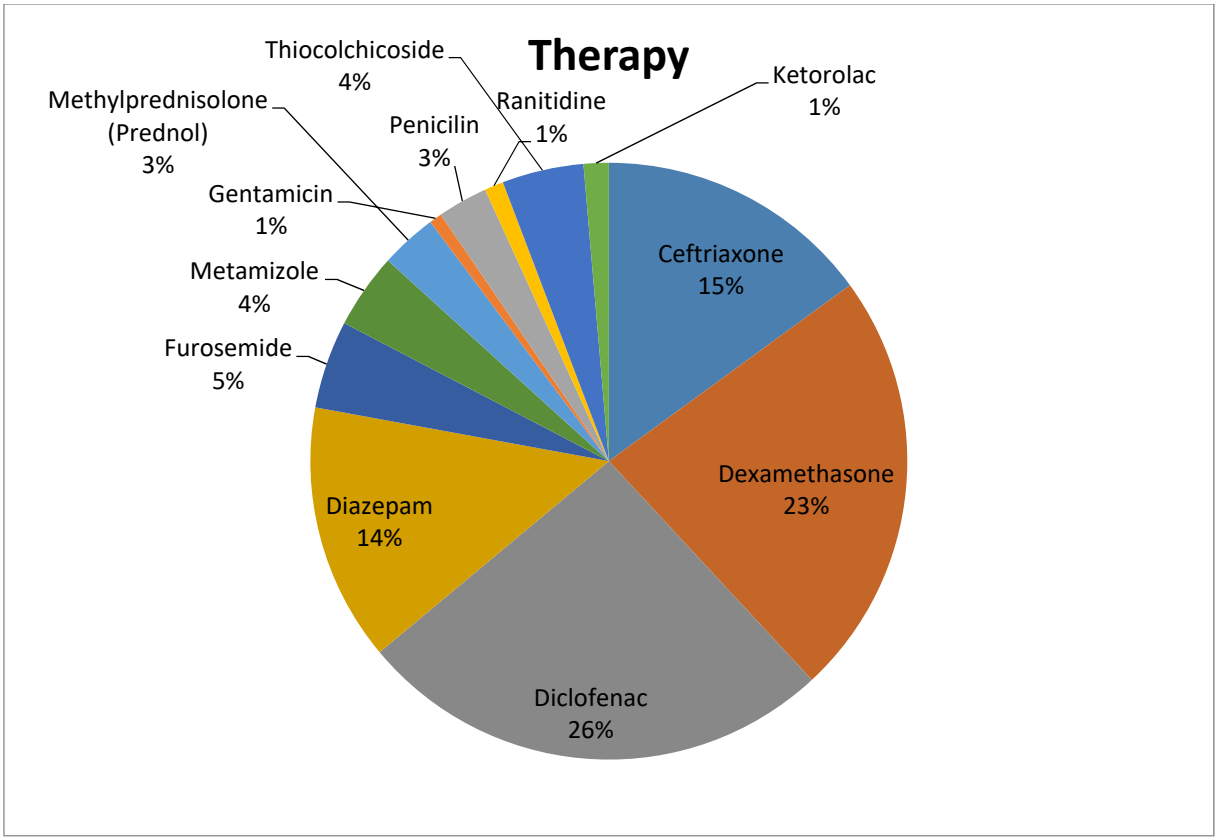

Figure 10: Presentation of therapy in percentage for the month of May

4.6. Presentation of the results for the month of June

In this sector, the patients treated in the month of June will be presented, which were a total of 134, of which 70 (52.2%) were male and 64 (47.8%) were female (Fig. 11).

While in the data collected in the use of the drugs as therapy in the month of June, Diclofenac was the durg most frequently used with 26%, followed by Dexamethasone with 23%, Ceftriaxone with 14%, and Diazepam with 11%. Other drugs used in a smaller rate were : Thiocolchicoside and Ketorolac with 5%, Methylprednisolone with 4%, Penicilin and Furosemide with 3%, Fraxiparin with 2% Ranitidin, Gentamicin and Metamizole with 1% (Fig. 12)

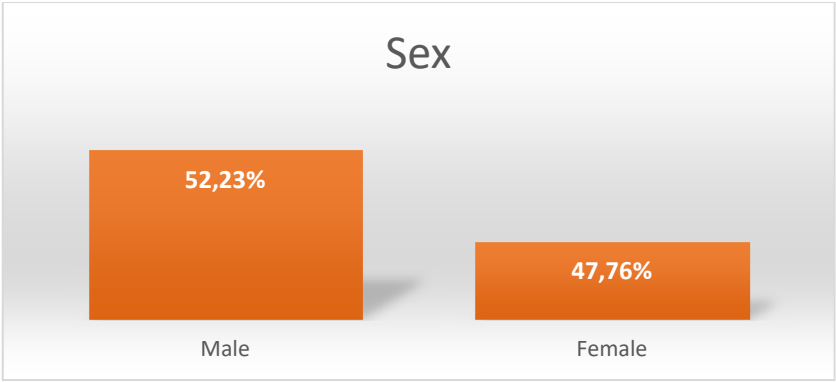

Figure 11 : Presentation in percentage by sex for the month of June.

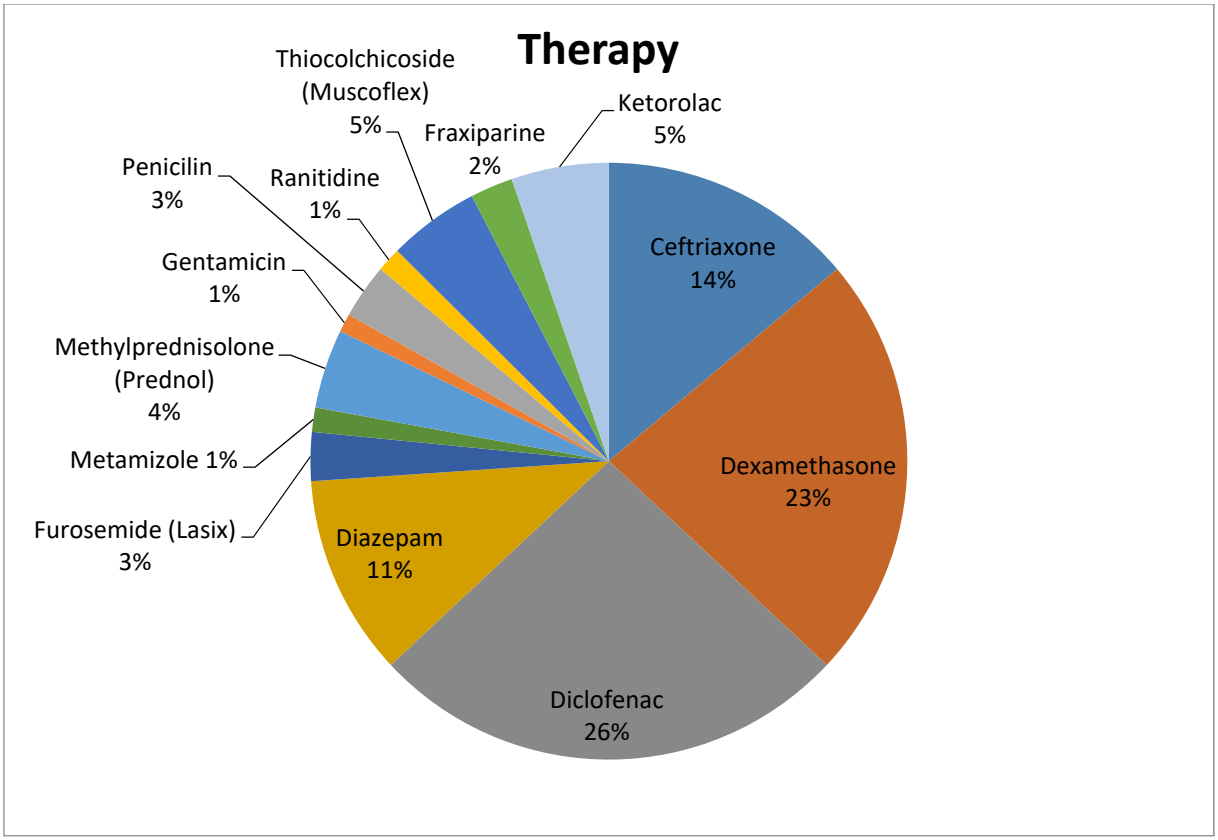

Figure 12: Presentation of therapy in percentage for the month of June.

4.7. Presentation of the results for the month of July

In this sector, the patients treated in the month of July will be presented, which were a total of 141, of which 62 (44 %) were male and 79 (56 %) were female (Fig. 13).

Data collected in the use of the drugs as therapy in the month of July did not differ from June. Again, Diclofenac was the durg most frequently used with 25%, followed by Dexamethasone with 24%, Ceftriaxone with 16%, and Diazepam with 10%.

Other drugs used in a smaller rate were : Thiocolchicoside, Ketorolac, Methylprednisolone, Penicilin, Furosemide, Fraxiparin Ranitidin, Gentamicin and Metamizole (Fig. 14)

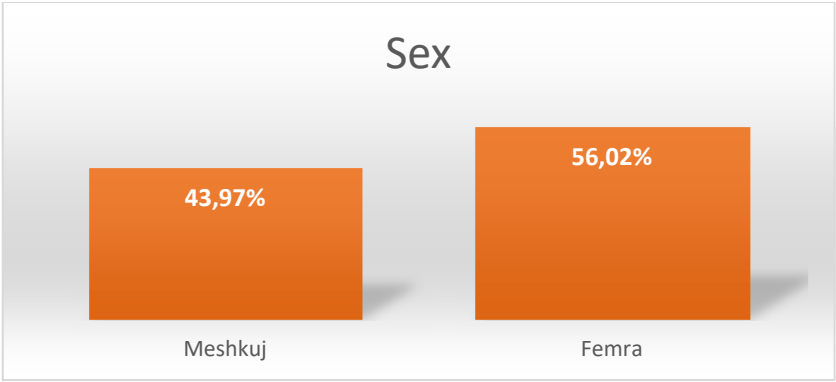

Figure 13 : Presentation in percentage by sex for the month of July.

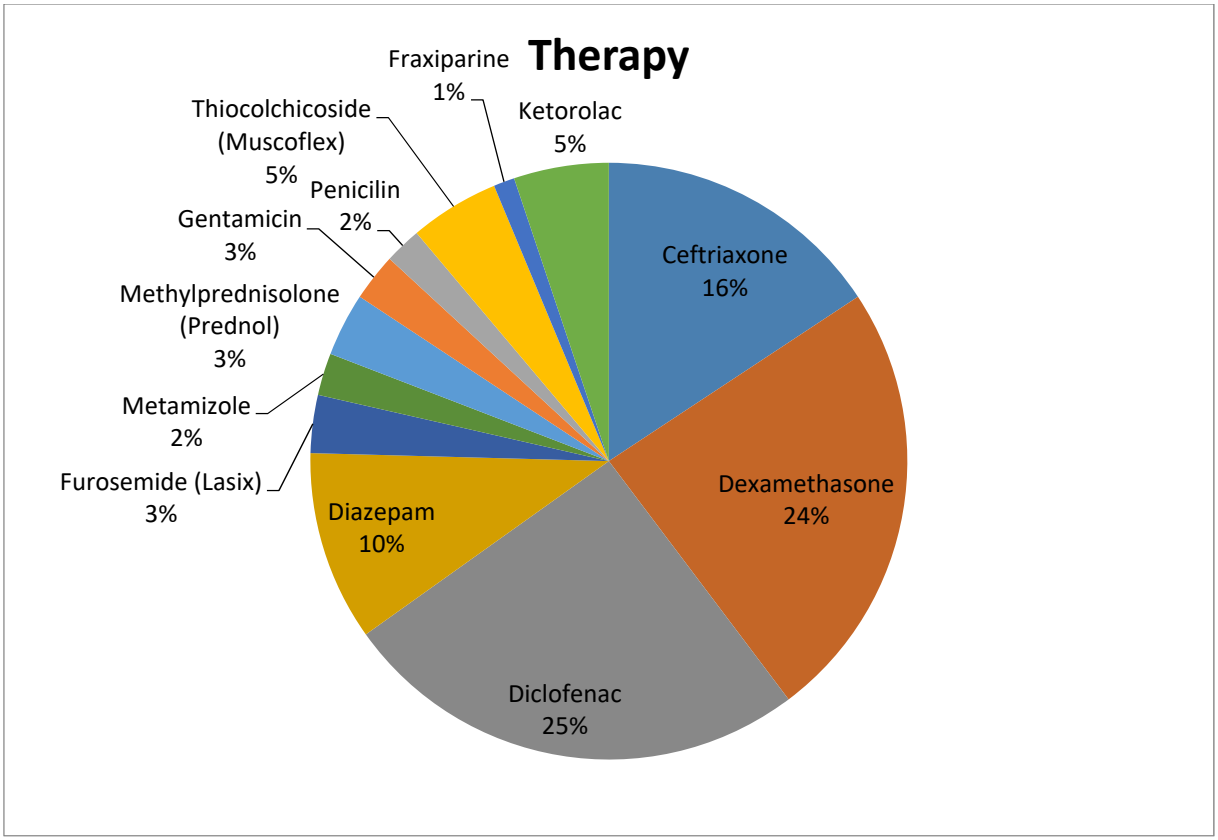

Figure 14: Presentation of therapy in percentage for the month of July.

4.8. Presentation of the results for the month of August

In this sector, the patients treated in the month of June will be presented, which totaled 146, of which 64 (43.8%) were male and 82 (56.2%) were female (Fig 15)

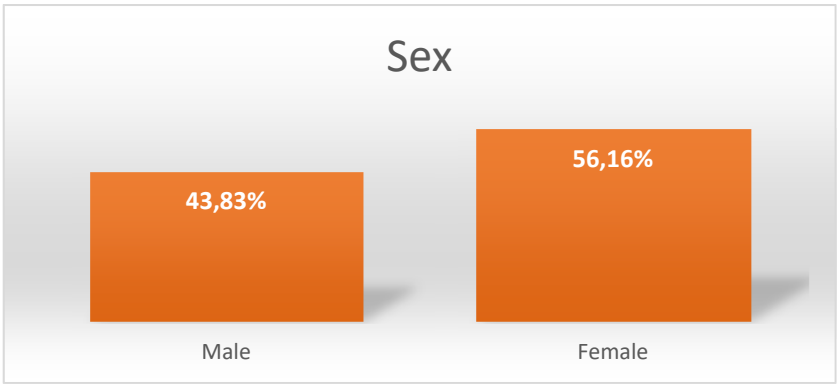

Figure 15 : Presentation in percentage by sex for the month of August.

We again evaluated the therapy used in the next month, August of 2021, and we noticed the same trend with Diclofenac and Dexamethasone being the most used ones, 24 % and 23% respectively. While those used less were as follow: Ketorolac and Thiocolchicoside with 5%, Methylprednisolone and Furosemide with 4%, Metamizole and Penicilin with 2%, and Ranitidine, Gentamicin and Fraxiparine with 1% (Fig 16).

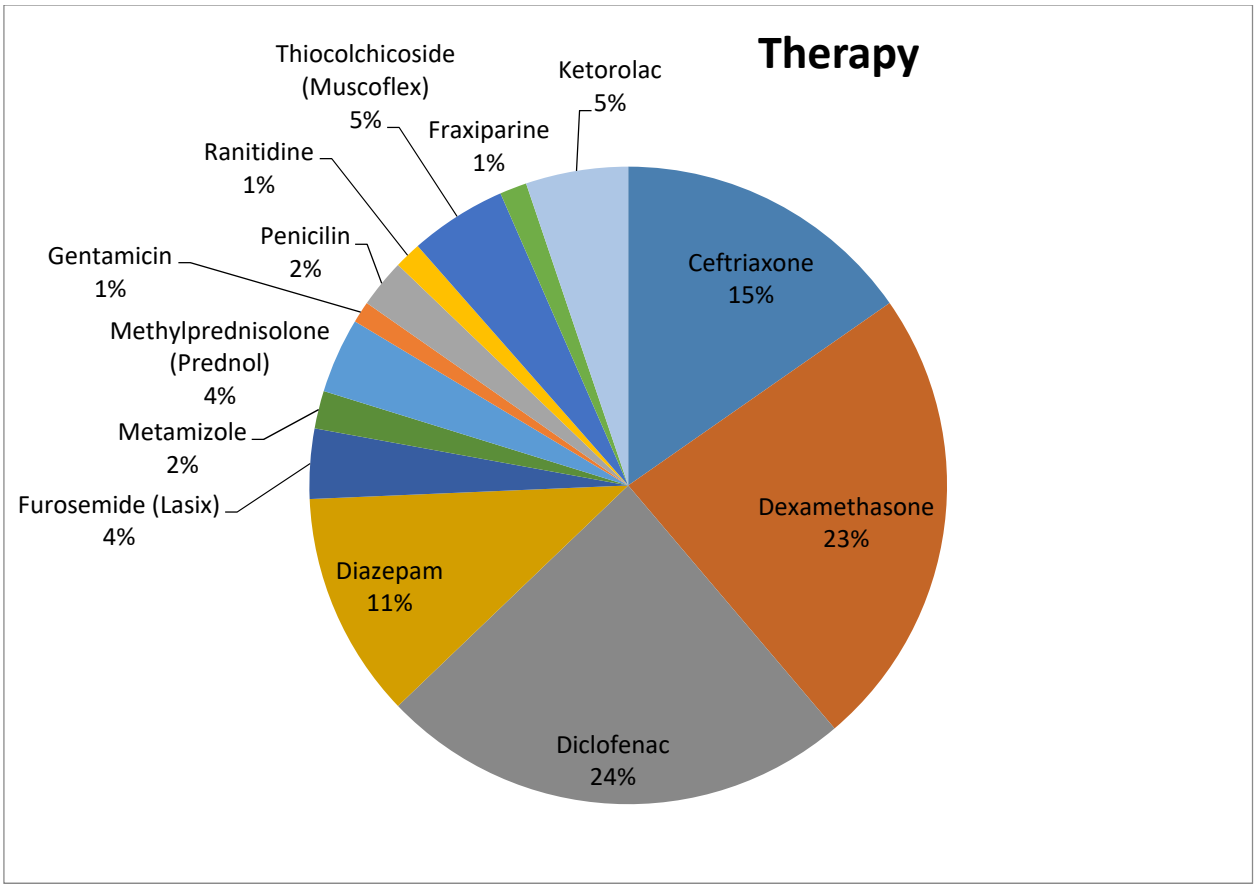

Figure 16: Presentation of therapy in percentage for the month of August.

4.9. Presentation of the results for the month of September

In this sector, the patients treated in the month of July will be presented, which were a total of 161, of which 72 (44.7 %) were male and 89 (55.3 %) were female (Fig. 17).

Data collected in the use of the drugs as therapy in the month of September show that Dexamethasone was the durg most frequently used with 23%, followed by Diclofenac with 21%, Ceftriaxone with 15%, and Diazepam with 12%.

Other drugs used in a smaller rate were : Thiocolchicoside, Ketorolac, Methylprednisolone, Penicilin, Furosemide, Fraxiparin Ranitidin, Gentamicin and Metamizole (Fig. 18)

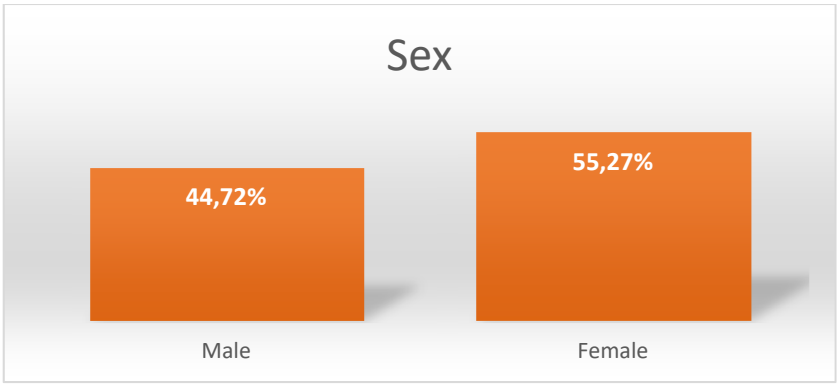

Figure 17 : Presentation in percentage by sex for the month of September.

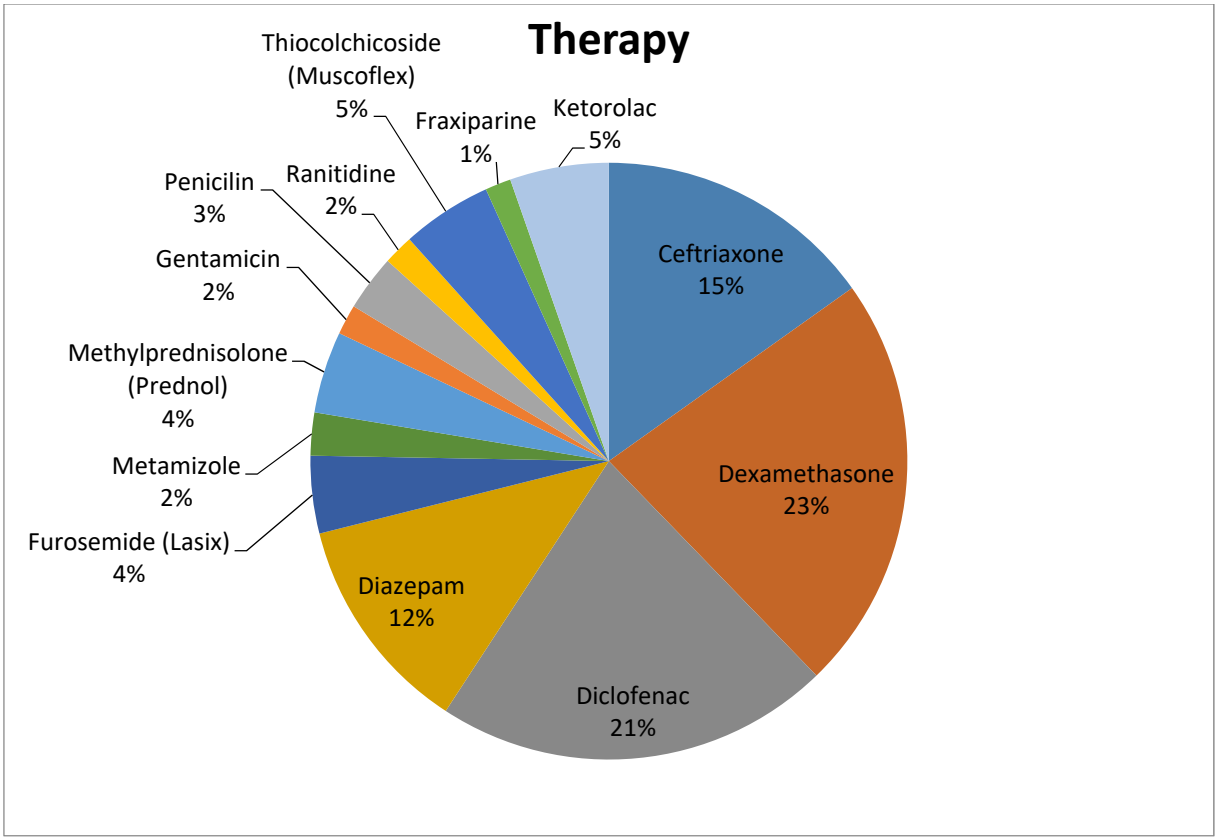

Figure 18: Presentation of therapy in percentage for the month of September.

4.10. Presentation of the results for the month of October

During the month of October total of 176, from which 85 (48.3%) were male and 91 (51.7%) were female (Fig 19). As per the treatment, the trend was the same as during the rest of the year, with Diclofenac being the most used one 24%, Dexamethasone with 23%, Ceftriaxone with 16% and Diazepam with 13%. The rest of the treatments consists of: Ketorolac with 5%, Methylprednisolone and Thiocolchicoside with 4%, Penicilin with 3%, Metamizole with 2%, Ranitidine, Gentamicin and Fraxiparine with 1% (Fig 20).

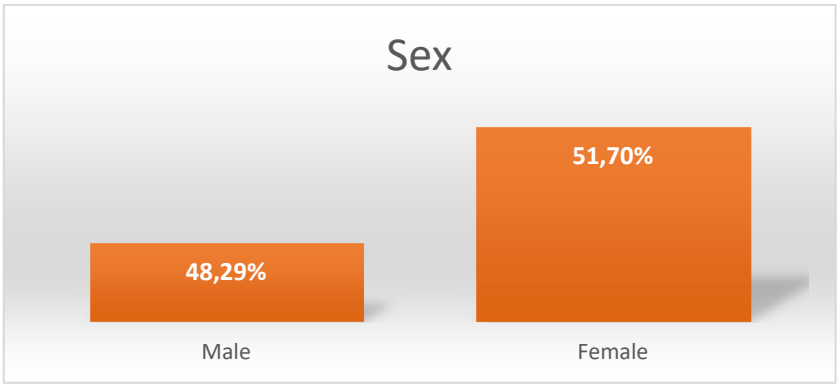

Figure 19 : Presentation in percentage by sex for the month of October.

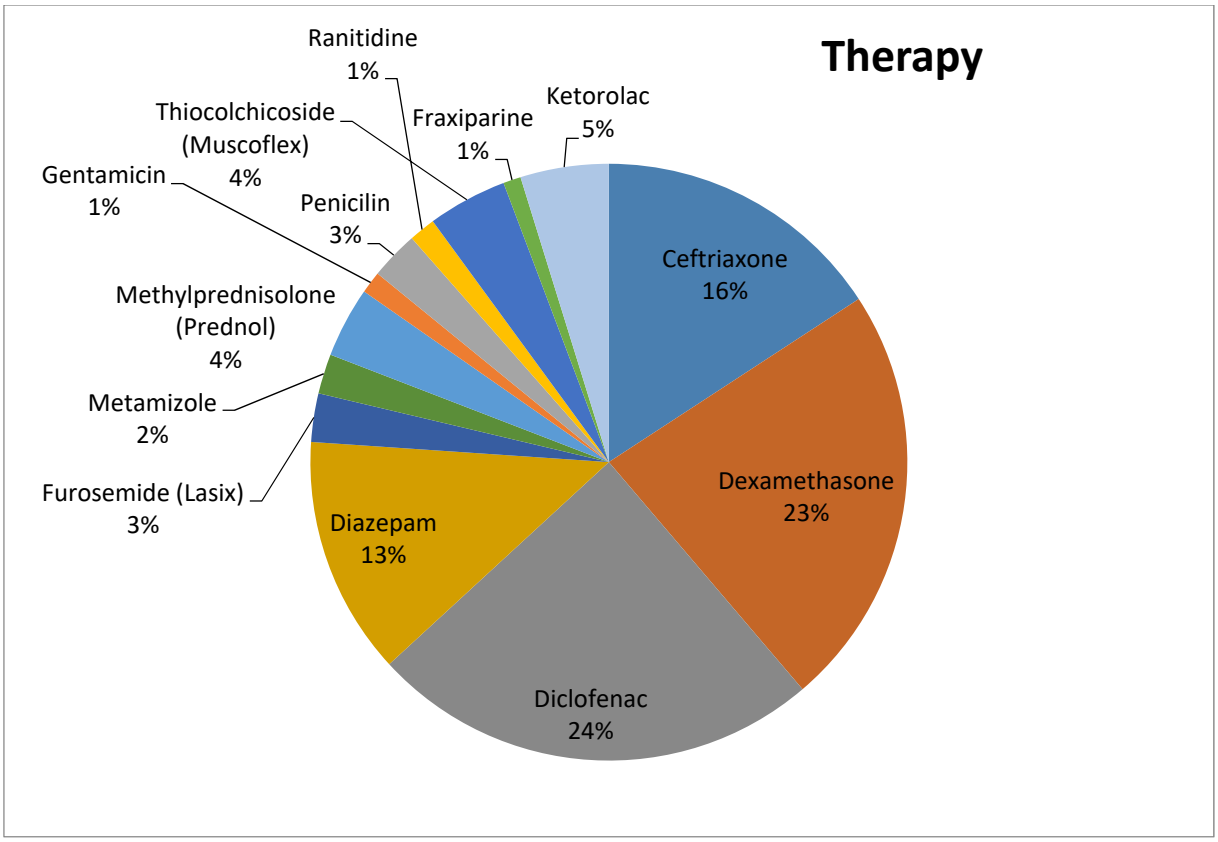

Figure 20: Presentation of therapy in percentage for the month of October.

4.11. Presentation of the results for the month of November

November was characterized with a total of 198 patients, of which 91(45.9 %) were male and 107 (54 %) were female (Fig. 21).

Again, Diclofenac was the one most used with 23%, followed by Dexamethasone with 21%, Ceftriaxone with 15%, and Diazepam with 13%. Other drugs used in a smaller rate were : Thiocolchicoside, Ketorolac, Methylprednisolone, Penicilin, Furosemide, Fraxiparin Ranitidin, Gentamicin and Metamizole (Fig. 22)

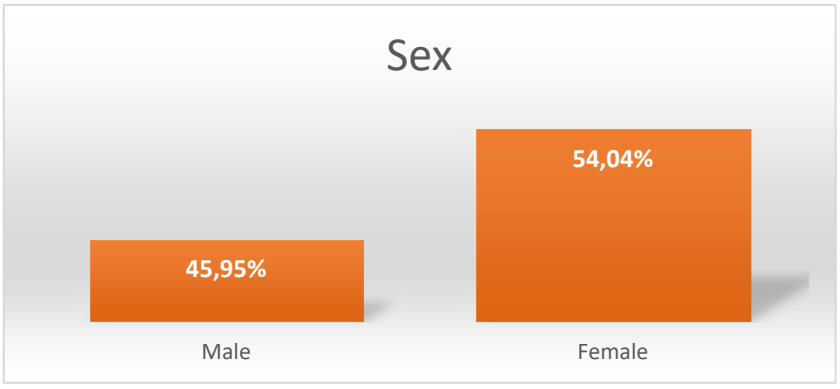

Figure 21 : Presentation in percentage by sex for the month of November.

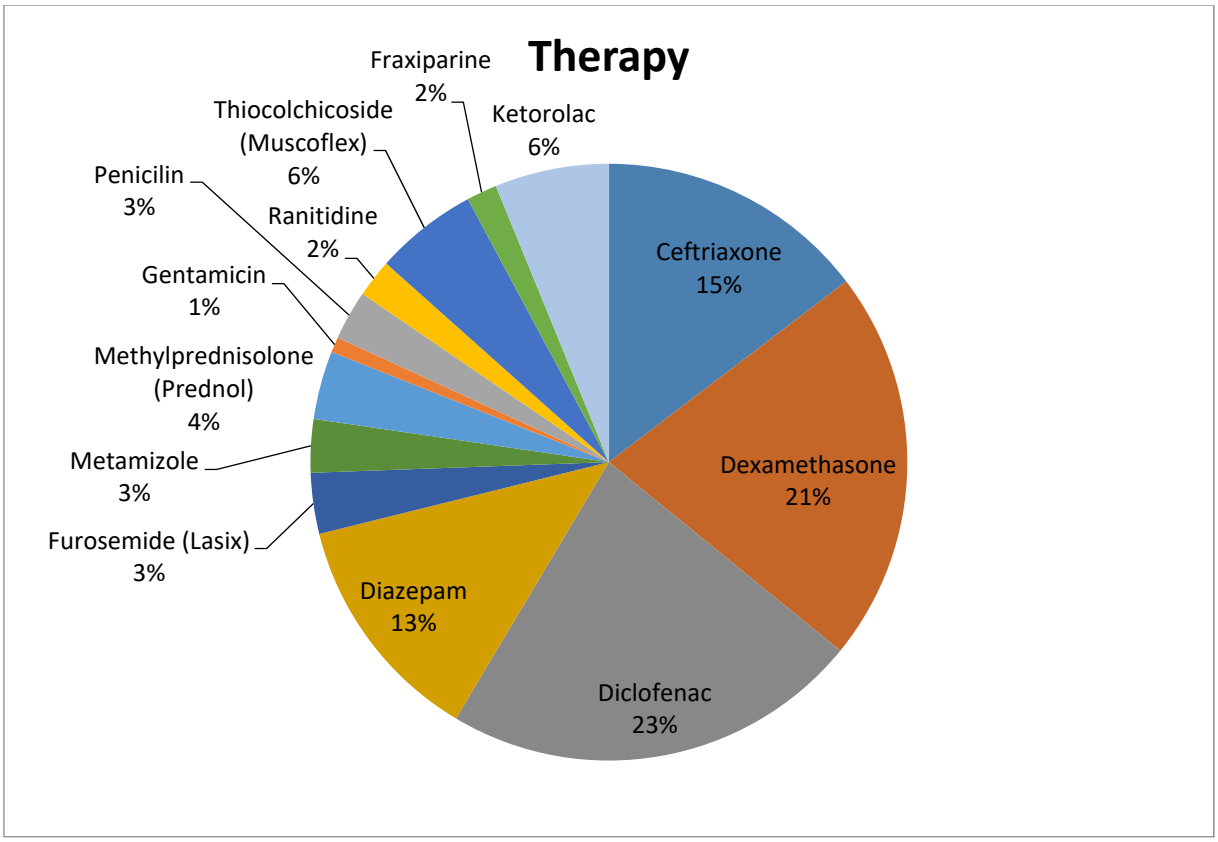

Figure 22: Presentation of therapy in percentage for the month of November.

4.12. Presentation of the results for the month of December

Whereas in December 189 patients needed treatment, of which 86 (45.5%) were male and 103 (54.5) were female (Fig 23). The therapy used in this month in terms of percentage was the same between Dexamethasone and Diclofenac with 23% each. While Ceftriaxone was 15% and Diazepam with 12%. Again, this was followed by drugs used less such as : Thiocolchicoside, Ketorolac , Methylprednisolone, Penicilin, Furosemide, Fraxiparin Ranitidin, Gentamicin and Metamizole (Fig. 24)

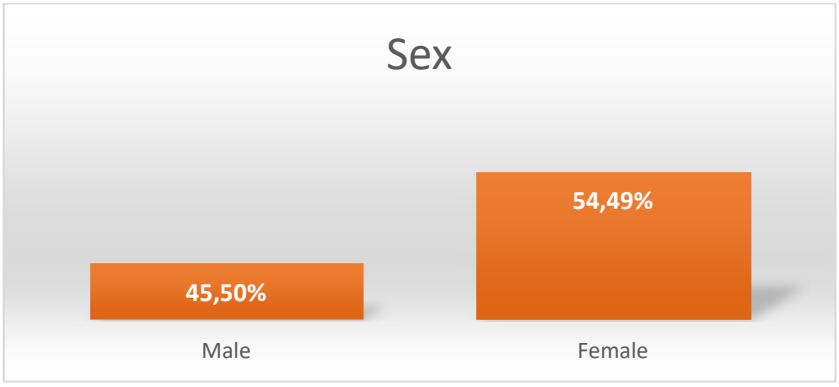

Figure 23 : Presentation in percentage by sex for the month of December.

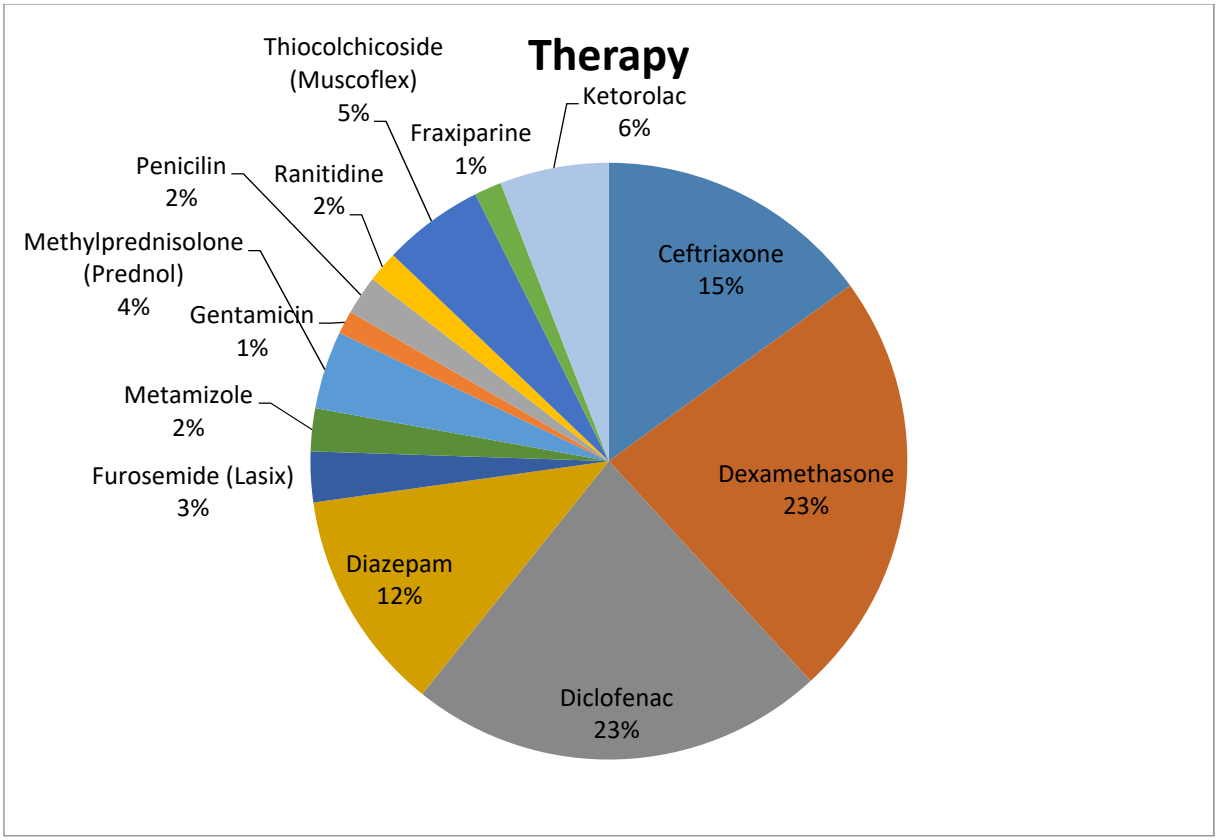

Figure 24: Presentation of therapy in percentage for the month of December.

V. Discussion And Conclusion

Based on the review of the relevant literature and the analysis of the protocols at the Center of Family Medicine in a local hospital in Kosovo, this research paper reveals data as follows:

- In the period January-December 2021, a total of 1908 patients were treated.
- Of them, 884 were male and 1024 were female
- The most frequent therapy was: Ceftriaxone, Dexamethasone, Diclofenac and Diazepam.

The purpose of treatment with intramuscular injections is to treat various diseases. While the intramuscular administration of the drugs is mainly done for achieving a faster absorption and therefore reaction. In this work, we wanted to collect data and get information on which are the drugs mostly used via intramuscular administration. Thus, we have observed that during all the year the most used drugs are as follow: Diclofenac, Dexamethasone, Ceftriaxone and Diazepam. While the therapy with Diclofenac and Dexamethasone, during the year, were interchangeable in terms of percentage, this change was not significant. Whereas, Ceftriaxone and Diazepam remained always the third and fourth most used drugs, respectively.

Moreover, in this work we have observed that apart from the antibiotic treatment which was used to treat bacterial infections, the other often therapy containing Dexamethasone, Diclofenac and Diazepam, otherwise known as D3 therapy, it is administered in family medicine centers including the one we have presented.

Not to our surprise, we have noticed that during the winter season which is characterized with a higher incidence of flu and flu-like symptoms, there was a higher flow of patients who were treated intramuscularly. Whereas, during the months of summer there was a slight decrease of the patients' flux seeking for therapy.

Taken together, these data have shown a higher use of mainly four drugs such as Diclofenac, Dexamethasone, Ceftriaxone and Diazepam. And the period which was characterized with a higher number of patients needed to be treated with the above-mentioned therapy was during winter season.

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