

Blood Donation – Medical Benefits for Blood Donors, Regarding the Management of Metabolic Parameters

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SUMMARY

It is recognized the importance of transfusion therapy, indicated in a very large panel of diseases. The therapy depends on self-sufficiency, the capacity to cover all hospitals demands. The major interests when we refer to Blood Transfusion centers, are the capacity to promote blood donation, to increase the return rate, in order, to build a reliable pool of regular blood donors. The study is focused on pre-donation and annual biochemical tests, performed along the year 2021. According to certain biochemical parameters deviations, we'll present the medical protocol, which was followed, the personalized management of different situations. According to the analyze and attitude, all the medical benefits will be presented for each category.

Keywords: Blood Donation; Metabolic Disorders; Prophylactic Medicine; Reliable Pool of Blood Donors

Aim of the Study

Taking into account the significant number of individuals who donated blood during 2021, the admitting and rejection criteria, as critical deviations of certain biochemical parameters, we tried to identify different categories of deviations, isolated or mixed, and the correlation with gender, age, blood donor category and dietary and lifestyle characteristics. Once identified, we design different templates of personalized monitoring, according to the type of deviation, having the main interest in clarification, of each situation, till either permanent or temporary rejection, with re-admission to blood donation. In this study, we want to highlight the on one side importance of blood donation, as basic when about transfusion therapy, on the other side the major benefits of the blood donor, due to periodically extended blood tests, for monitoring the health

status, for identifying – whenever occur metabolic disorders – curative/ preventive measures.

Materials and Methods

The study was done in Blood Transfusion Center Oradea, Bihor County. There were used: medical records, and donors' files, where we noticed (paper and electronical support)/explained and managed each situation, from clinical and laboratory paraclinical points of view [1-3]. Was analysed the activity along the year 2021, represented by 11839 blood donations (total blood and platelets apheresis) collected from 6913 blood donors. Even if it's known that the definition of blood donor, implies a healthy status, along with mandatory screening tests, as a general rule, during pre-donation evaluation (in selected cases) and annually for the regular

donors, there are performed extended biochemical evaluations. There were performed a total number of 26549 of evaluation lab tests, represented: blood glucose, urea, creatinine, calcium, magnesium, cholesterol, triglycerides, uric acid, total proteins, total bilirubin, and iron. From the biochemical parameters there were chosen those in relation with potential metabolic disorders: blood glucose, cholesterol, triglycerides, total bilirubin, and ALT, all being correlated with gender, age, blood donor category, BMI (body mass index) and smoking habit.

The deviations were noticed in donor's files (paper and electronic support), the donors were contacted by phone, and invited to return for the second check of significantly altered parameters, for medical interview, life and diet style assessment/ counseling, and where was necessary, guidance toward the general practitioners, or other specialists, such as, metabolic diseases specialists [4,5]. The evaluation was done and traced individually, till medical clarification, with subsequent reevaluation of blood donation admitting criteria.

Results

The distribution of the blood donors, along the year 2021, is represented according to number, gender, age, and blood donor category, in (Table 1 & Figure 1). From the total number of chosen tests, done either pre-donation, or as part of the periodic control/ evaluation there, were identified 299 blood donors with significant deviations of the assessed metabolic parameters. The distribution of these categories was assessed according to gender (Figure 2), ABO group/Rh factor (Figure 3), blood donor category (Figure 4), age (Figure 5) and presence of a risk factors, such as smoking) (Figure 6). According to age and gender distribution of significant deviation of blood glucose, the distribution is presented in (Figure 7). According to age and gender distribution of significant deviation of cholesterol level (> 240 mg%), increased isolated, the distribution is presented in (Figure 8). According to age and gender distribution of significant deviation of triglycerides level (>250 mg%), increased isolated, the distribution is presented in (Figure 9).

Table 1: The distribution of total number of blood donors (6919) during 2021.

| Gender | Females Donors | | | Males Donors | | |
|---------------|----------------|---------|------------|--------------|---------|------------|
| Age/ category | First | Regular | Occasional | First | Regular | Occasional |
| <20 years | 59 | 46 | 11 | 76 | 66 | 16 |
| 21-30 years | 125 | 379 | 48 | 297 | 982 | 127 |
| 31-40 years | 146 | 398 | 59 | 249 | 1158 | 232 |
| 41-50 years | 116 | 405 | 44 | 161 | 998 | 131 |
| 51-65 years | 26 | 141 | 29 | 47 | 321 | 30 |

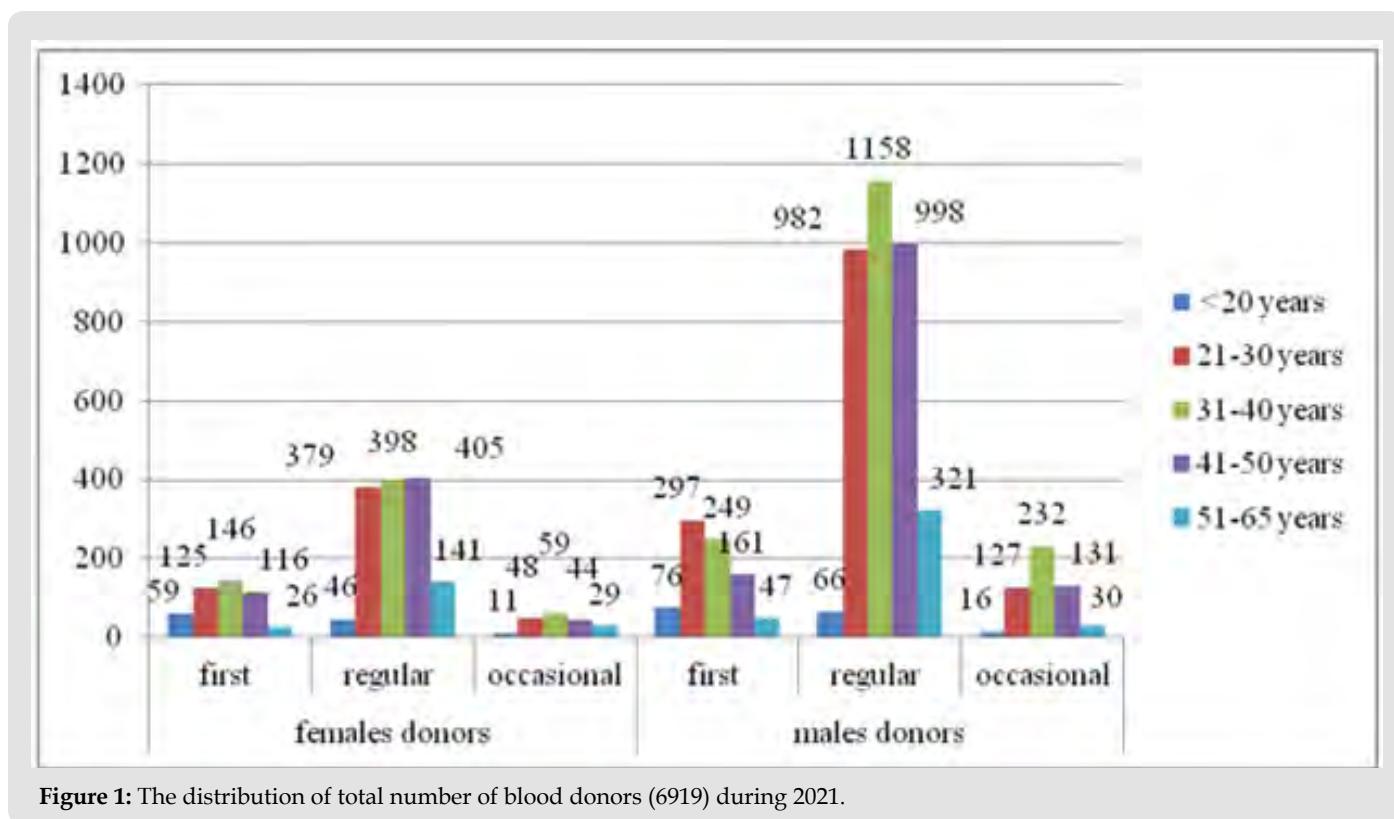


Figure 1: The distribution of total number of blood donors (6919) during 2021.

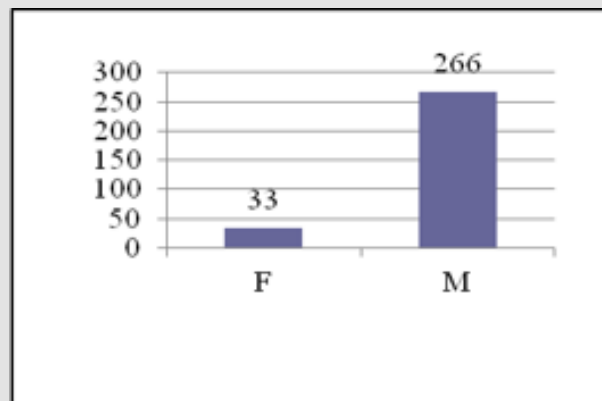


Figure 2: The distribution according to gender.

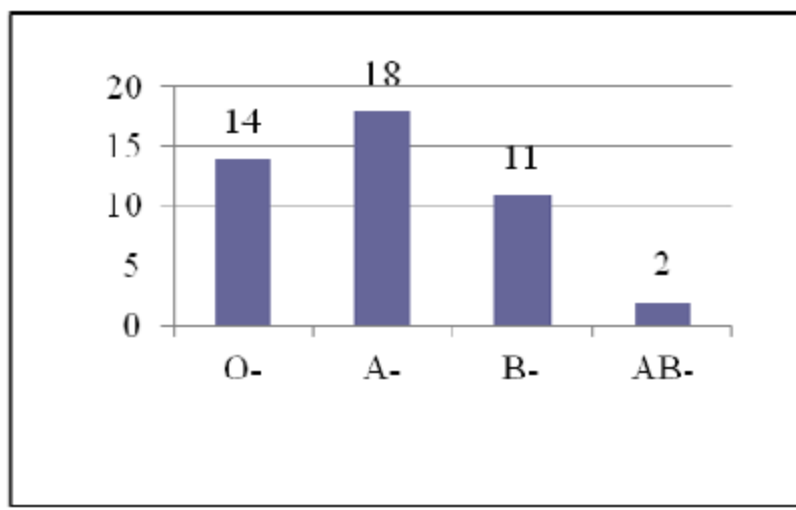
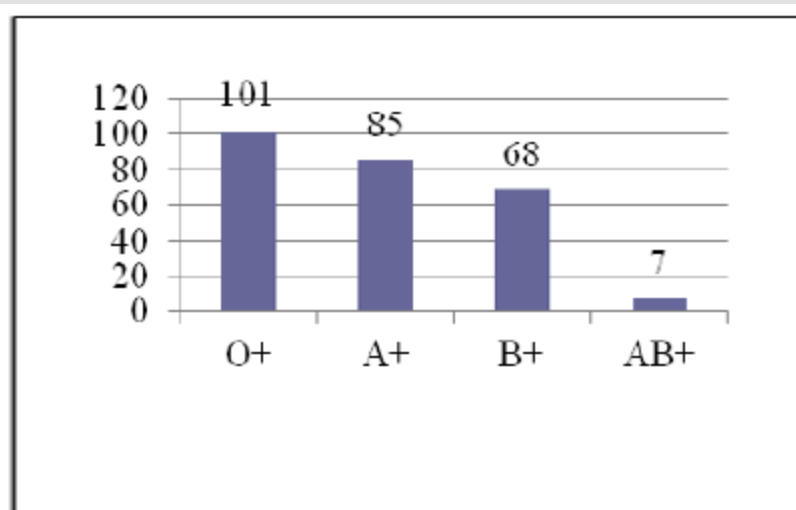


Figure 3: The distribution according to ABO group/ Rh factor.

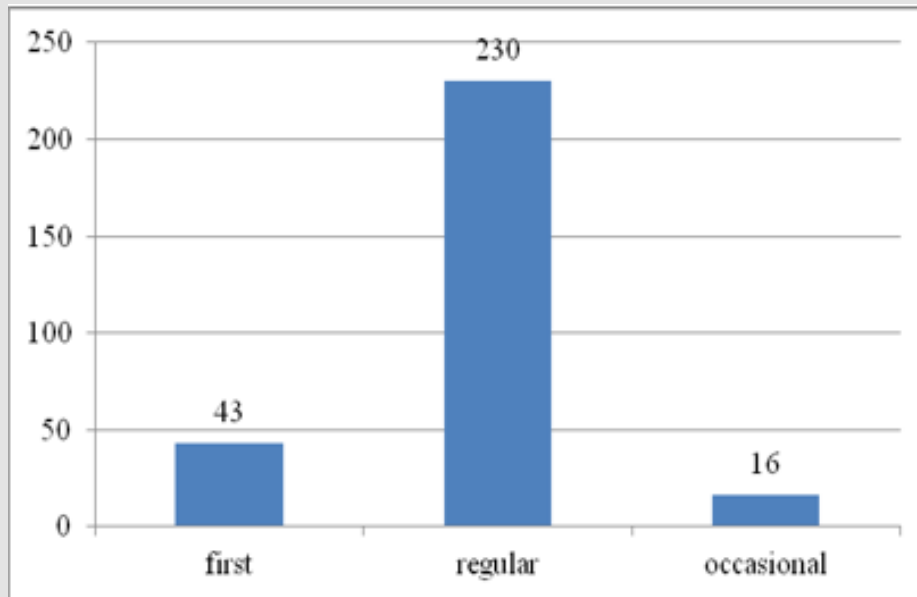


Figure 4: The distribution according to blood donor category.

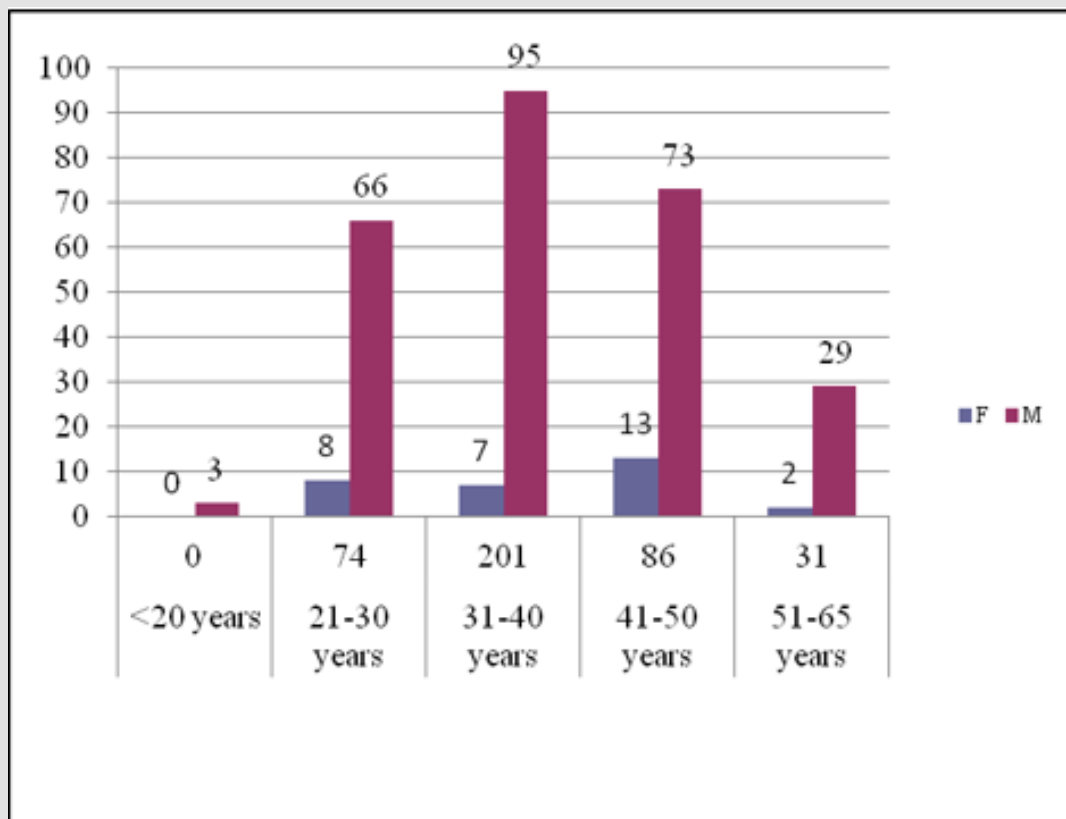


Figure 5: The distribution according to age/ gender.

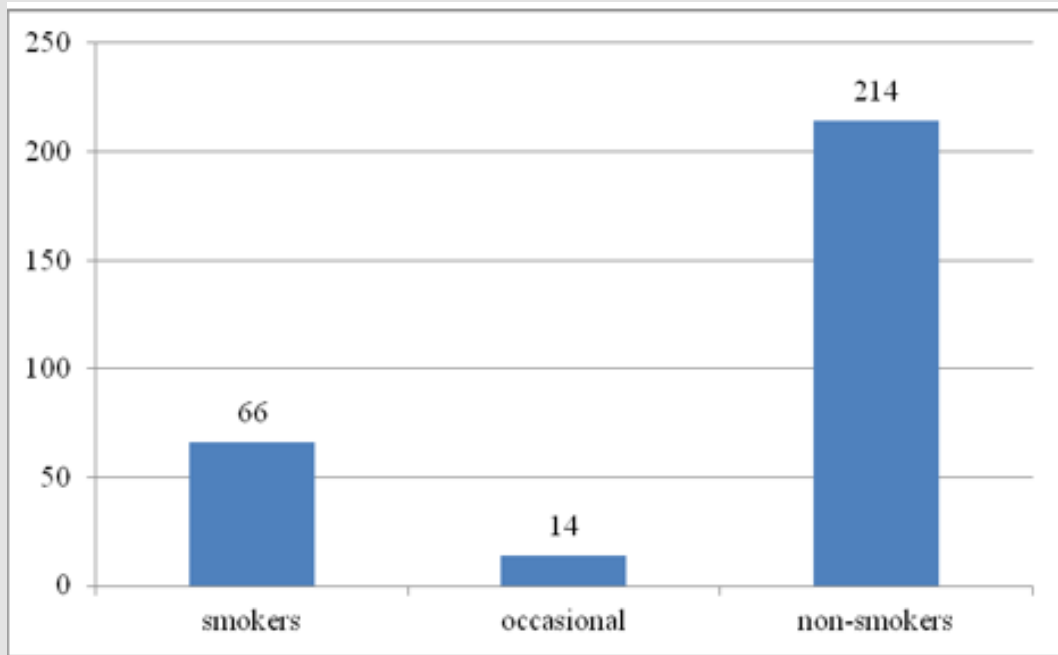


Figure 6: The distribution according to smoking habit (risk factor).

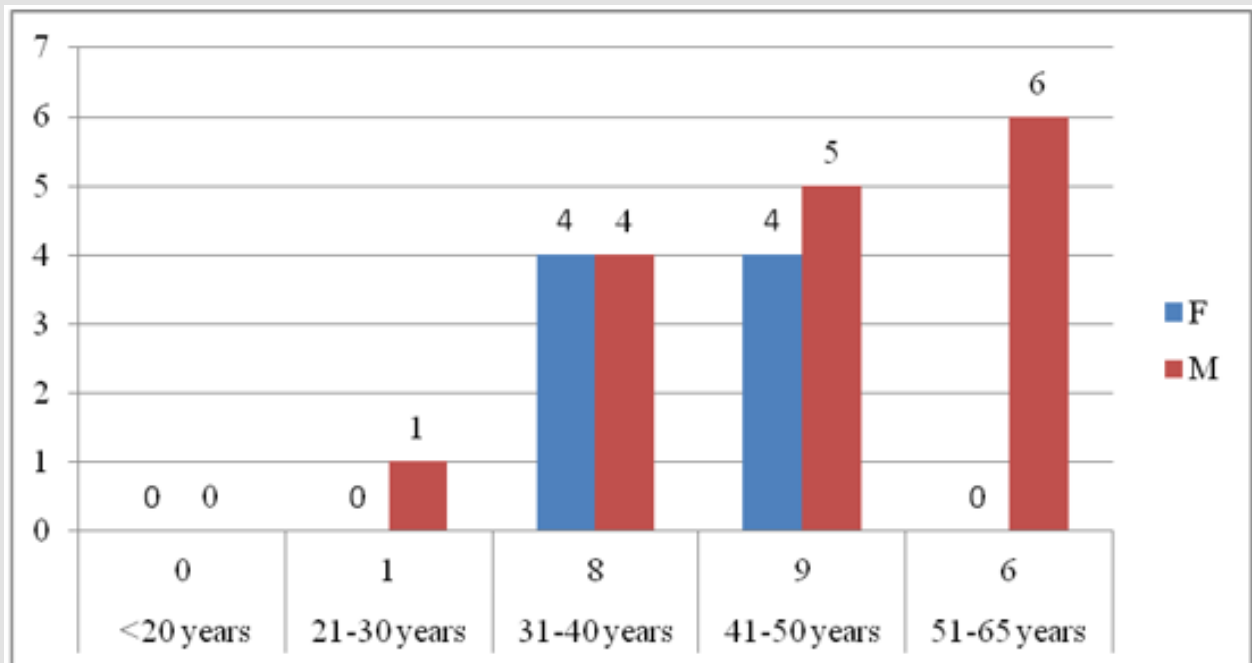


Figure 7: The distribution of significant deviation of blood glucose, according to age and gender.

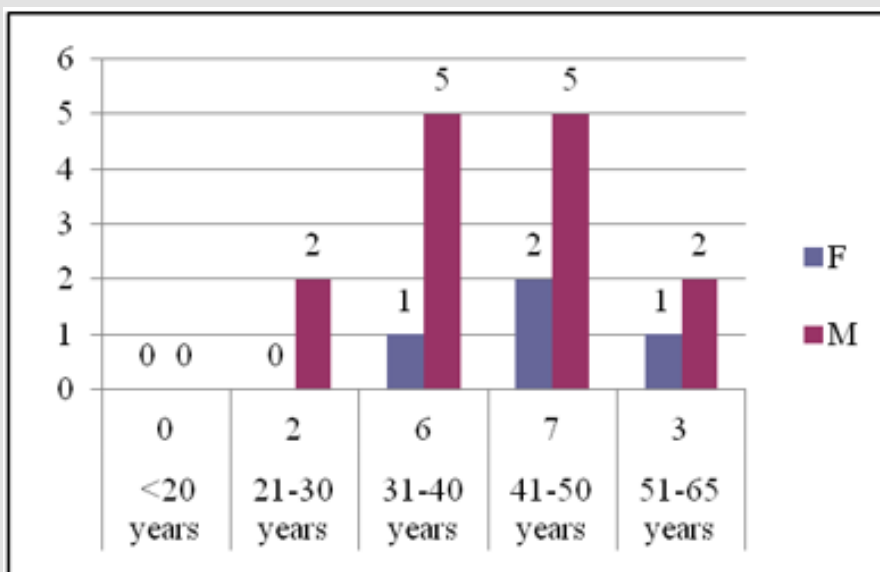


Figure 8: The distribution of significant deviation of cholesterol, according to age and gender.

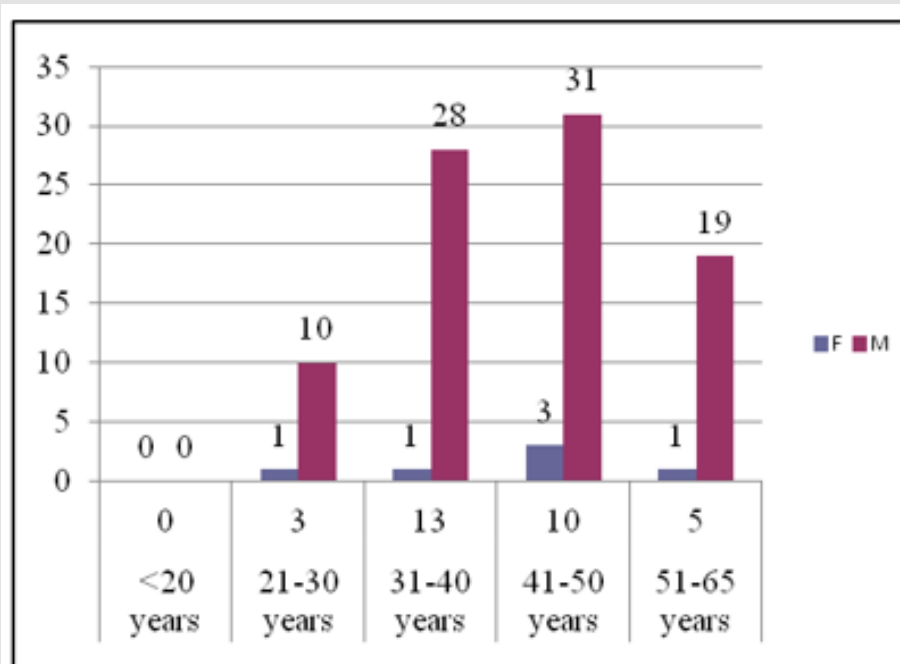


Figure 9: The distribution of significant deviation of tryglicerides, according to age and gender.

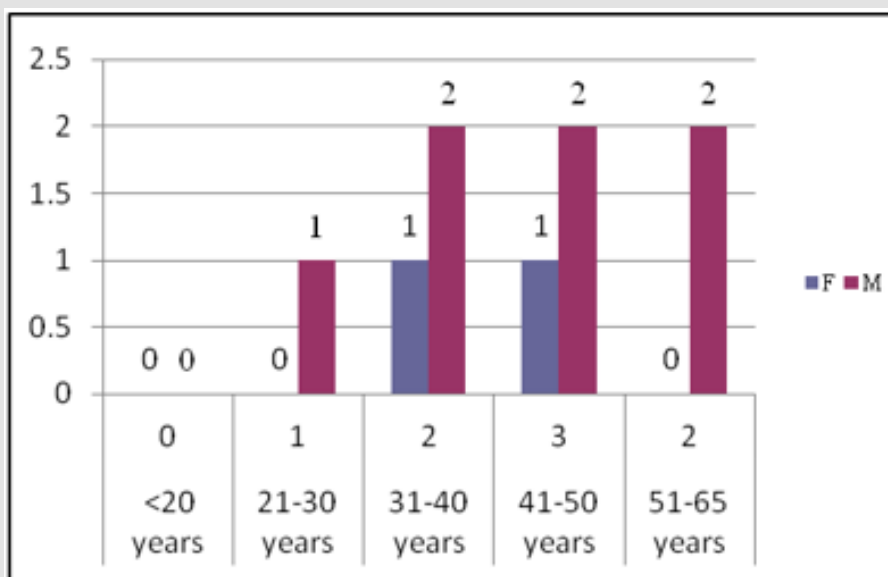


Figure 10: The distribution of significant mixed deviation of cholesterol and tryglicerides, according to age and gender.

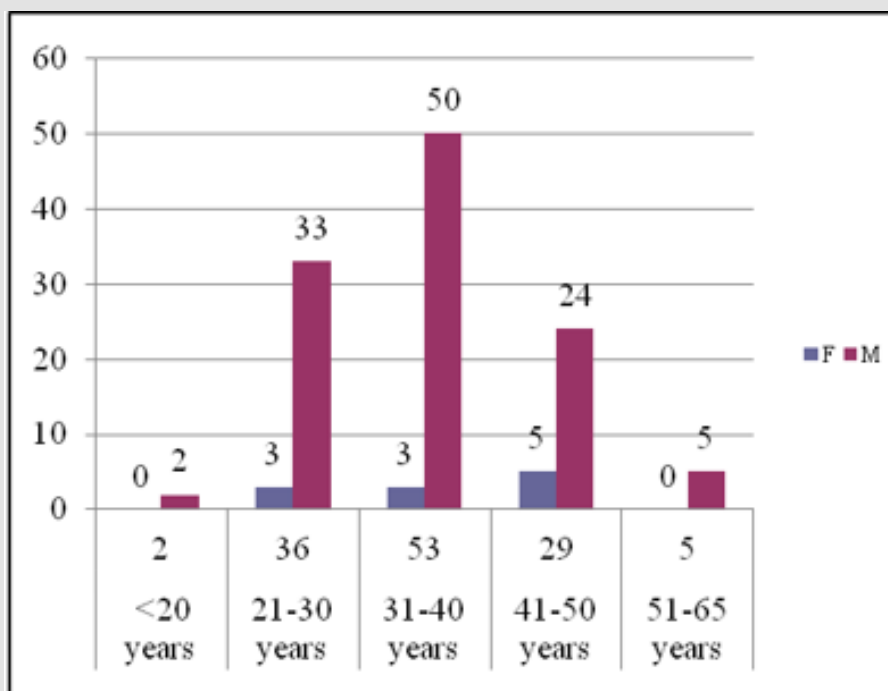


Figure 11: The distribution of significant deviation of ALT, according to age and gender.

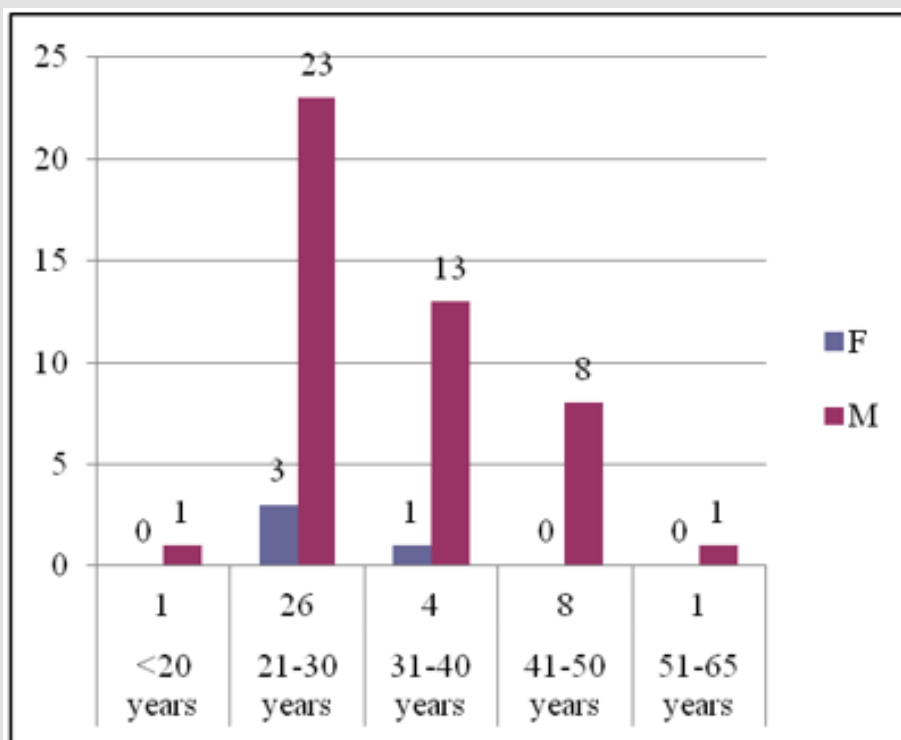


Figure 12: The distribution of significant deviation of TBI, according to age and gender.

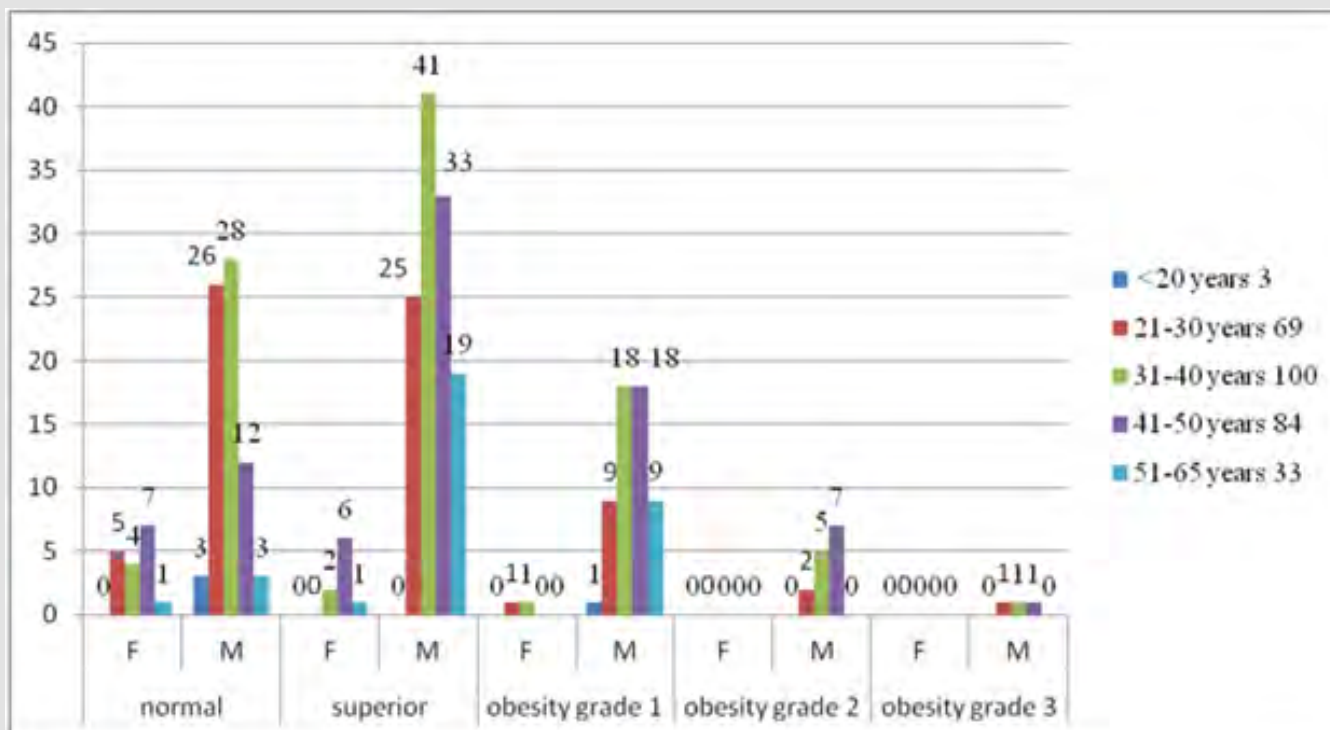


Figure 13: The distribution of significant deviation of BMI, according to age and gender.

According to age and gender distribution of significant deviation of mixed deviation of cholesterol (> 240 mg%) and triglycerides level (>250 mg%), the distribution is presented in figure 10. According to age and gender distribution of significant deviation of ALT (> 80UI/l), the distribution is presented in (Figure 11). According to age and gender distribution of significant deviation of TBI (total bilirubin) (> 1.7 mg%) the distribution is presented in (Figure 12). According to age and gender distribution of BMI (body mass index) the distribution is presented in (Figure 13).

Discussion

For each parameter deviation/ blood donor, the physician responsible for blood donation admission, together with the nutritionist, analyzed, evaluated and followed the protocol: phone call for check-up, interview regarding the details of the diet and life style, potential side-effects of drugs administration, personalized counseling, or guidance toward the general practitioner, according to the conclusion of reevaluation and retesting outcome. Blood donation is an essential altruistic act, based on it, a lot of different pathologies can benefit by transfusion therapy. Even if the blood donor is considered a healthy individual, the extra-panel of biochemical parameters evaluation, has a tremendous importance, when we refer to the possibility of metabolic disorders occurrence. The multidisciplinary team, represented by physicians, psychologists and nutritionists, is a very active and useful tool, in personalizing evaluations, education, or guide the individual, to further examinations, in order to have the general image and control of healthy status.

Due to this strategy, in case of higher blood glucose levels, during the year 2021, were diagnosed 2 regular blood donors (8.33%) out of 24, with Diabetes mellitus type 2 (with definitive exclusion from blood donation), 4 blood donors (16.6%) out of 24, with low resistance to insulin (being allowed to continue blood donation, but with periodically assessment of glucidic metabolism: blood glucose, GOTT (glucose oral tolerance test) HbA1c and HOMA-IR index); the diagnosis and monitoring, were done by the metabolic disorders specialist, and the medical papers were presented/ sent to the blood transfusion team. The isolated increase of cholesterol (18 cases) and tryglicerides (31 cases), was in 95% of cases, due to incorrect diet/ life style; the donors were very responsive, and after personalized counseling and monitoring the parameters values, were significantly decreased. 50% (4 cases) from the total number with mixed elevated cholesterol and tryglicerides, didn't respond to dietary and lifestyle changes (all of them being smokers), and were guided to the GP, where they were diagnosed with mixed dyslipidemia; due this diagnosis, they received specific treatment (statins and/ or fibrates) thus being postponed from blood donation, because of potential hepatic side-effects.

In case of sGPT, only in 2 (1.6%), out of 125 cases, the higher

levels, were associated with status of chronic carrier of AgHBs; in the others cases the detailed interview revealed: abuse of alcohol, NSAIDs chronic use; when ALT was repeatedly elevated more than 6 six the donor was postponed, with the indication of hepatoprotective drugs, with periodical evaluation, being in close contact/ communication with the GP. Two (4.34%) out of 46 of male blood donors, with repeatedly higher TBI levels, were guided to GP, and eventually were diagnosed with Gilbert's syndrome; this situation requires the predonation TBI test, in order to respect the macroscopic quality standards of blood components. In females, all deviations were reversible, and according to the detailed investigations, were due to dietary/ gall bladder reasons. In this study, there weren't noticed significant correlations between assessed biochemical parameters and the blood group/ Rh type.

Conclusion

The act of blood donation, done regularly, offers a lot of benefits to the blood donor, among these being the possibility to evaluate in detail, certain hematological and biochemical parameters, along with the set of mandatory screening tests. Most of the blood donors, with certain metabolic disorders, have shown significant improvement, in already mentioned parameters, by changing their lifestyle and habits, this being another way of prophylactic/ preventive approach. This strategy shows the importance of a multidisciplinary team, the communication between the Blood Transfusion professionals and GPs; because of this, we were able to get certain diagnosis, so the individuals could receive proper treatment, without postponing the diagnosis. The blood components stocks are much better managed, with significant decrease of rejected blood units, due to the deviations of evaluated biochemical parameters. Based on this approach we gain the blood donors' trust, with a higher returning rate, because it is known that an efficient transfusion therapy is based on reliable pool of regular donors.

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