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Effect of Gender and Age on the Cardiac Enzyme (Creatinine Kinase, CKmm)

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ABSTRACT

Creatine kinase is expressed at high levels in muscle, where it plays a central role in energy metabolism. Amid to explore the effect of gender and age on baseline blood creatine kinase levels in a large group of adults. Material and Methods: The collected samples 382 from four labs in three Cities in the eastern region of Libya, where 36 samples were collected from the Al-Bara laboratory (83 samples from the Al-Rashid laboratory from the Derna City, 182 samples from the Al-Biruni laboratory in the Tobruk City and 81 samples from the Al-Razi laboratory from Benghazi. Result: The Creatinine Kinase (CK) Result for 382 samples was a high percentage of 215 (56.3 %) and the normal percentage of 167 (43.7 %), the Frequency and percentage of males 196(51.3%), and for females 186(48.7 %), the relationship between age group and the result of Creatinine Kinase (CK) that the highest result was in (51 – 55 years) followed by (41 – 45 years), (61 – 65 years) and > 80, the difference between male and female in the result of Creatinine Kinase (CK) that the number of the highest result was 110 in males, 105 in females, but there are not a huge difference between them, the difference between male and female in the result of Creatinine Kinase (CK) the Correlations between Creatinine Kinase (CK) Result and age, gender due to the p-value more than 0.000. Conclusion: Data analysis shows that age and sex do not affect the result of creatinine cardiac enzymes (CK).

INTRODUCTION

In this research, we wanted to shed light on whether there are differences between males and females in cardiopathy by one of the cardiac enzymes, CKmm stands for creatinine. A critical comparison statistic that doctors use to identify patients who need further testing and evaluation is reference intervals. Laboratory tests are based on reference intervals (Clifford et al., 2011). Gender-specific factors may not be required in the interpretation of the data because the cardiac marker should be part of the usual screening of hypertensives (Efobi & Bassey, 2021). Relationships between Troponin and CKMm I with gender, and cardiac enzymes CKMm and Troponin I have a robust relationship. (Eljamay & Nuesry, 2024), over the past ten years, there have been significant advancements in our understanding of the impact of biological sex on myocarditis and DCM; yet, there are still many unanswered questions.

To create future disease-targeted and individualized treatment methods, a deeper comprehension of the consequences of sex and gender is required.(Fairweather et al., 2023), Compared to white North Americans of the same sex, black people have been found to have higher levels of total serum creatine kinase activity. (Gledhill et al., 1988), Age, gender, and genetic modifiers all have a significant influence on the effects of CK insufficiency (Lygate et al., 2012), among the male patients, there were also noteworthy relationships with Cr-CPK, Cr-creatine kinase-MB, Fe-age, and other variables. Age-lactic dehydrogenase, creatine phosphokinase isoenzyme-aspartate aminotransferase, lactic dehydrogenase-creatine phosphokinase isoenzymes, Pb-Fe, and Cu-Co were among the pairings of investigated parameters in female patients that showed

significant associations (Mazhar et al., 2011), Because age, gender, and racial/ethnic origin all highly influence average creatine kinase levels (Neal et al., 2009).

Women recover from CK responses more quickly than men do. In men, the CK and DOMS response work together, but not in women. Women have a prolonged DOMS reaction, which may be impacted by the menstrual cycle (Oosthuyse & Bosch, 2017). Men are more likely than women to have cardiovascular disease, which is linked to diabetes (Singh et al., 2022), evidence that the effects of estrogens on hObs are mediated differently depending on age and sex via both ER and ER pathways, with an as-yet-unidentified mechanism.(Somjen et al., 2011), It is essential to employ reference limit-based definitions of positive CK test findings that account for the significant variations in CK levels among ethnic and gender categories of healthy individuals (Wong & Haywood, 1983).

METHODS

Collected sample

The collected samples 382 from four labs in three Cities in the eastern region of Libya, where 36 samples were collected from the Al-Bara laboratory, 83 samples from the Al-Rashid laboratory from Derna City, 182 samples from the Al-Biruni laboratory in Tobruk City and 81 samples from the Al-Razi laboratory from Benghazi (www.alrazimedlab.com) from 20\11\2023 To 24\01\2024.

Data Analysis

Data analyses were carried out using the Statistical Packages for the Social Sciences (SPSS Version 26.0) Data was described using frequency tables, and crosstabs the level of significance was adopted at $P < 0.05$, and X2

Ethical Approval

All participants were voluntary and informed about the objectives of the study and informed consent was obtained from all the participants. The study was conducted by the Declaration of Helsinki.

RESULTS AND DISCUSSION

The samples of this course were collected from laboratories in the Eastern Region and adopted the rationale of the Keryatnin Kainiz ratio of age and sex and explained the data, Table 1 shows the Frequency and percentage of Creatinine Kinase (CK) Results for 382 samples the high percentage 215(56.3 %) and the normal percentage 167(43.7 %), Table 2 show the Frequency and percentage of male 196(51.3%), and for females, 186(48.7 %), Figure 1 illustrated the relationship between age group and the result of Creatinine Kinase (CK) that the highest result was in (51 – 55 years) followed by (41 – 45 years), (61 – 65 years) and > 80, Figure 2 illustrated the difference between male and female in the result of Creatinine Kinase (CK) that the number of the highest result was 110 in males, 105 in females, but there are not a huge difference between them, Figure 2 the difference between male and female in the result of Creatinine Kinase (CK),

Table 3 noted that there were no Correlations between Creatinine Kinase (CK) Results and age, and gender due to the p-value more than 0.000. Our study differed from (Neal et al., 2009) which showed a life-dependent decline in Creatine kinase levels among men, and no such trend was observed among women.

Our study showed that there is no effect of age or sex on the level of creatinine Ck, this also differed from (Clifford et al., 2011)which noted that creatine kinase showed statistically significant gender differences across all age groups, with the exception of 6-8 years. A study (Fairweather et al., 2023) showed that more men with myocarditis have symptoms of chest pain while women have dyspnea. Men with myocarditis have been found to have higher levels of biomarkers of heart failure and creatine kinase, while women develop a better regulatory immune response. And that's contrary to what our study showed. There are higher levels of total creatine kinase activity of the same sex. And that such a difference between races was only noticeable to males as evidenced (Gledhill et al., 1988) in his study, In a study by (Lygate et al., 2012) chronically deficient mice in both muscle kinase, mitochondria and creatine eventually developed into congestive heart failure. The extent of this phenotype depends heavily on genetic background, sex, and age. A study showed (Mazhar et al., 2011) Female patients, included the pairs of thoughtful parameters, which showed significant associations between milk dihydrogen age, phosphoquinase and also disagreed with this study, In a study (Neal et al., 2009) an age-dependent decrease was observed in creatine kinase levels

among men, but no such trend was observed among women. Exceeding the average levels of creatine kinase for men, also this study is not consistent with our study, A study (Oosthuyse & Bosch, 2017) showed that women recover from CK responses more quickly than men. I also fell out with what I had to do. This study did not agree with our study where (Singh et al., 2022) explained that cardiovascular disease, associated with diabetes, has a higher risk factor in men than in women. Our studies agreed with (Eljamay & Nuesry, 2024) that there are no associations between CKMm and troponin 1 and sex. And then we're going to study factors other than age and sex, which is the genetic factor.

Table 1. Frequency and percentage of Creatinine Kinase (CK) Result

Creatinine Kinase (CK) Result	Frequency	Percent %
Normal	167	43.7
High	215	56.3
Total	382	100.0

Table 1 shows the Frequency and percentage of Creatinine Kinase (CK) Results for 382 samples the high percentage of 215 (56.3 %) and the normal percentage of 167 (43.7 %)

Table 2. Frequency and percentage of percentage of gender

Gender	**Frequency**	**Percent %**
Male	196	51.3
Female	186	48.7
Total	382	100.0

Table 2 shows the Frequency and percentage of males 196 (51.3%) and females 186 (48.7 %)

Figure 1 illustrates the relationship between the age group and the result of Creatinine Kinase (CK) the highest results were in (51 – 55 years) followed by (41 – 45 years), (61 – 65 years) and < 80.

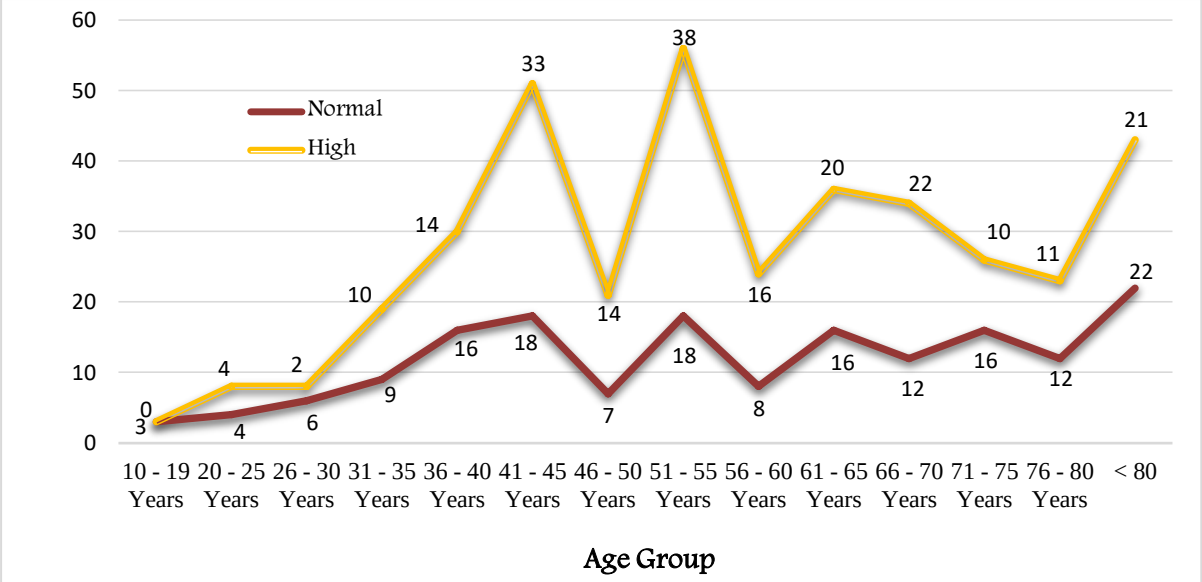

Figure 1. The relationship between age group and the result of Creatinine Kinase (CK)

Figure 2 illustrates the difference between males and females in the result of Creatinine Kinase (CK) the number of highest result was 110 in males, and 105 in females, but there are no huge difference between them.

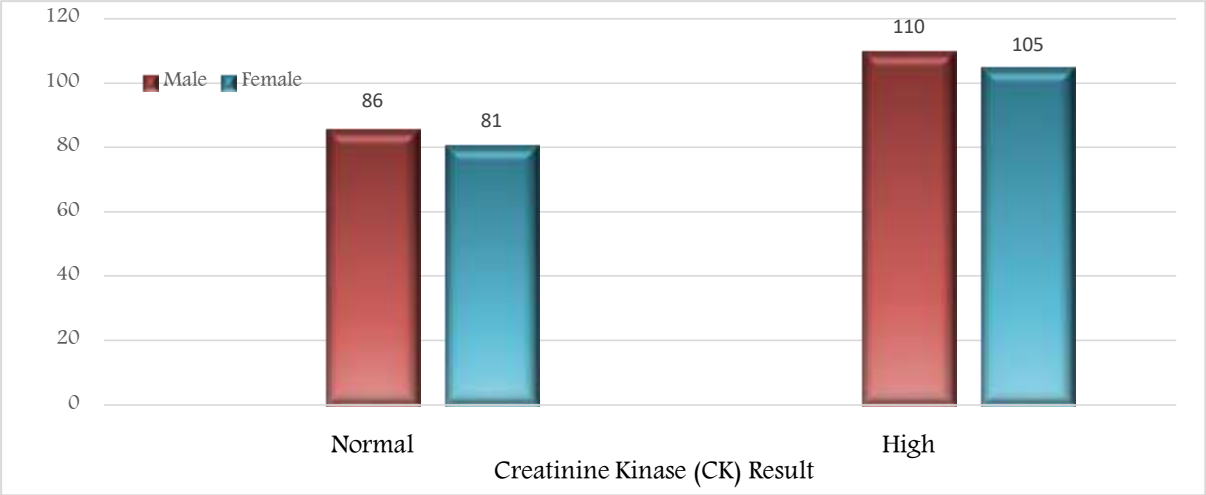

Figure 2. The difference between males and females in the result of Creatinine Kinase (CK)

Table 3 noted that there were no Correlations between Creatinine Kinase (CK) Results and age, and gender due to the p-value more than 0.000.

Correlations		Age	Gender
Creatinine Kinase (CK) Result	R	-0.014-	0.003
	P-Value	0.784	0.948
	X^2	20.876[a]	0.004[a]
	N	382	382
*. Correlation is significant at the 0.05 level (P-value).			

CONCLUSIONS

The study's data revealed that age and sex do not affect CK levels. Further research will explore genetic factors.

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