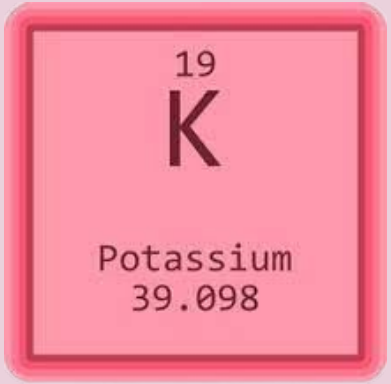
The Effect of Potassium, Magnesium and Calcium on Heart Rate

Fahima rashid

Rational

Millions of people take dietary supplements every year the reason for my project is to see the effect these electrolytes have on the heart rate.



Question

What effects do Potassium, Magnesium and Calcium have on Heart Rate?

Hypothesis

If I change the type of electrolyte then the heart rate of the daphnia will increase or decrease. I hypothesize that the potassium and calcium will cause fast irregular heartbeats while the magnesium will slow them down.

Variables and constants

Constants: the amount of water, the amount of the element

Iv= the type of electrolyte and the time

Dv= the heart rate of the daphnia Mangia at set times

Materials

Water

Jars

Electrolytes Microscope

Timer

Daphnia Magna

Test tubes

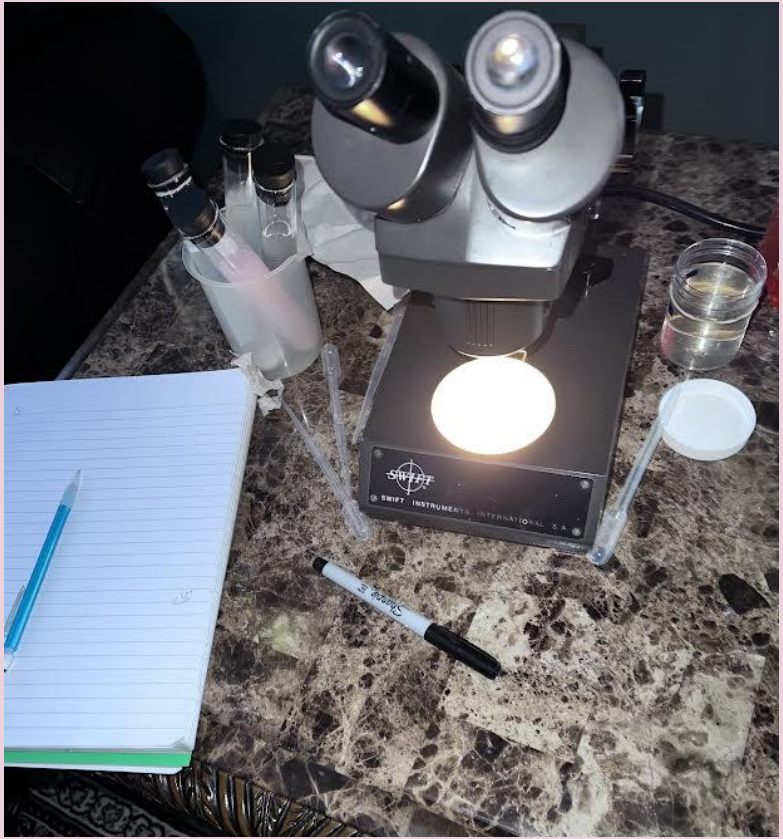
Phone

Trays

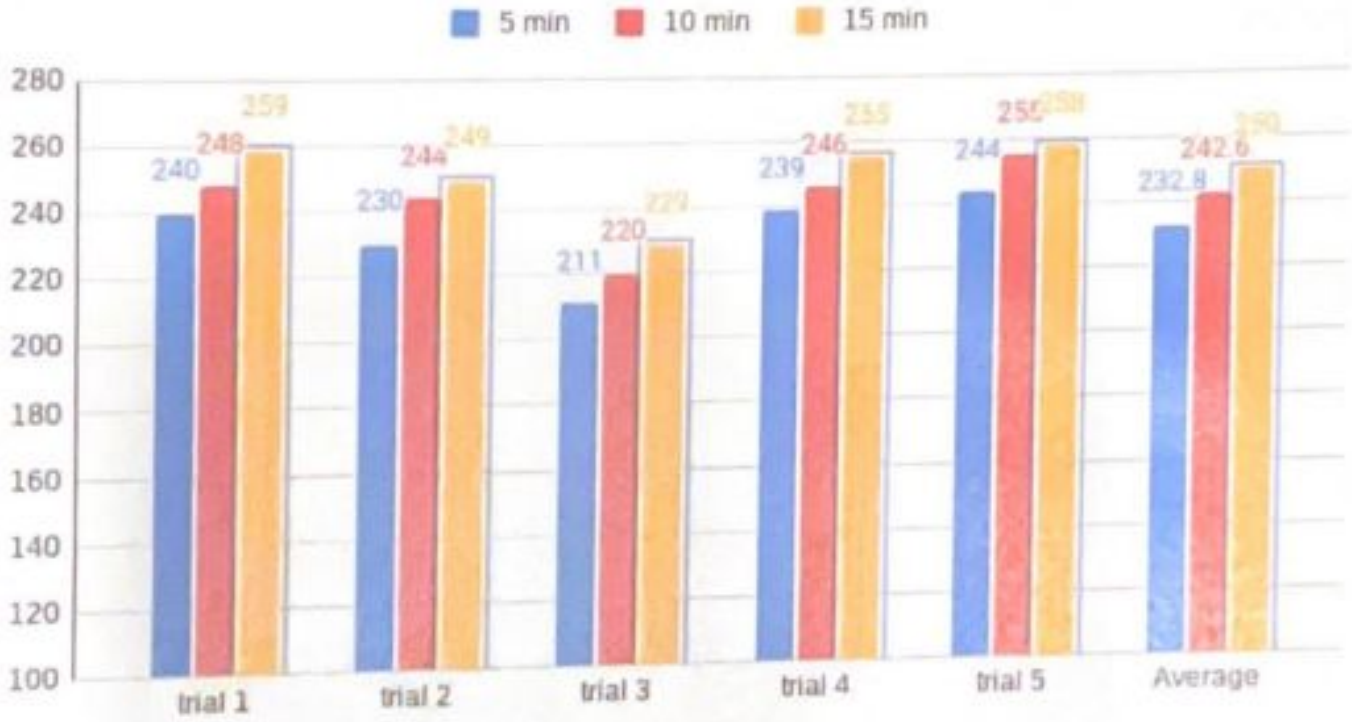
Procedure

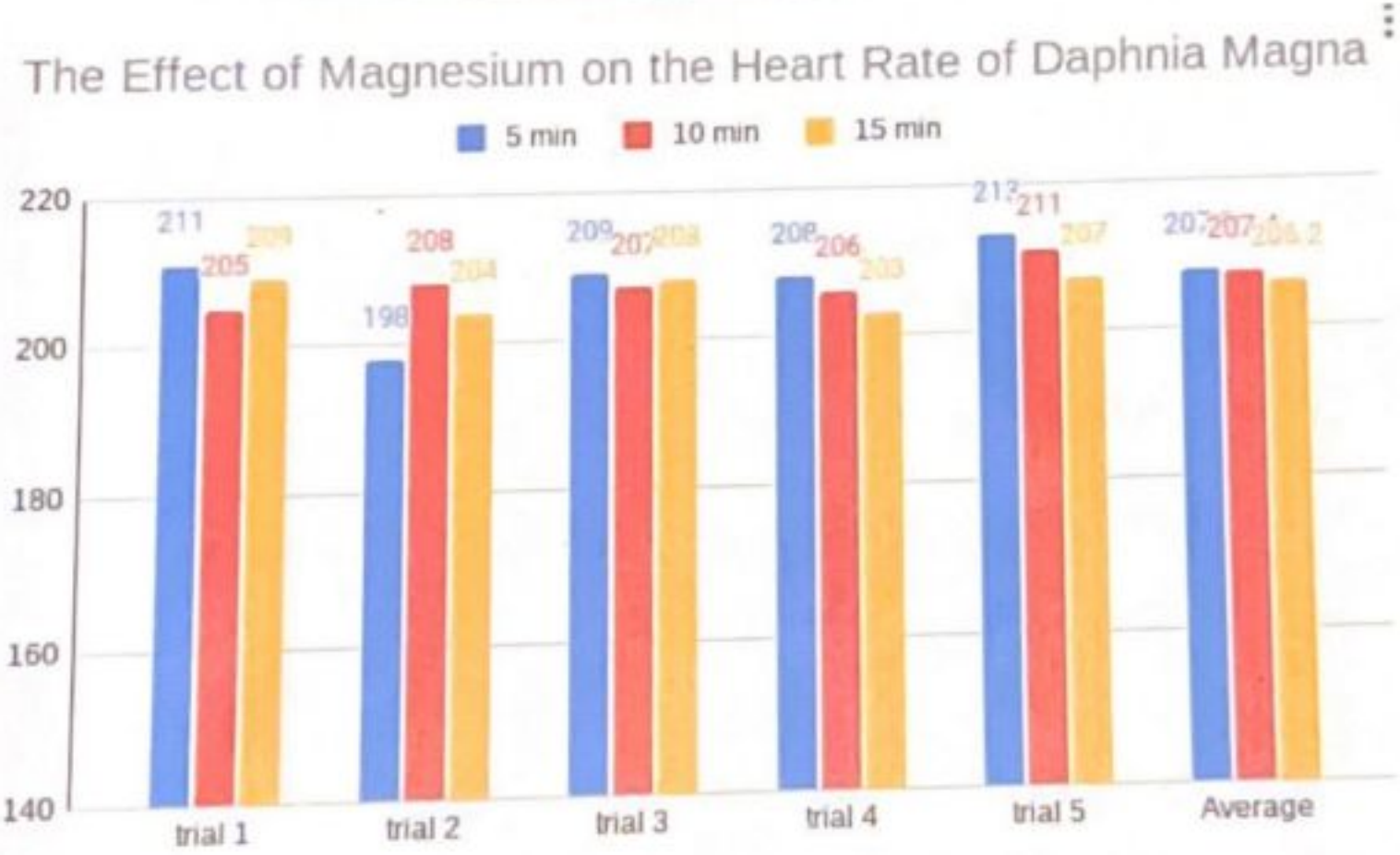
1. Crush tablets of magnesium calcium and potassium. And weigh them to 5g
2. Add the crushed tablets to 40g of water and shake
3. Set up microscope
4. Place daphnia on the tray using a dropper
5. Add the electrolyte water to the daphnia
6. Place the phone on the microscope to record heart rate

Images

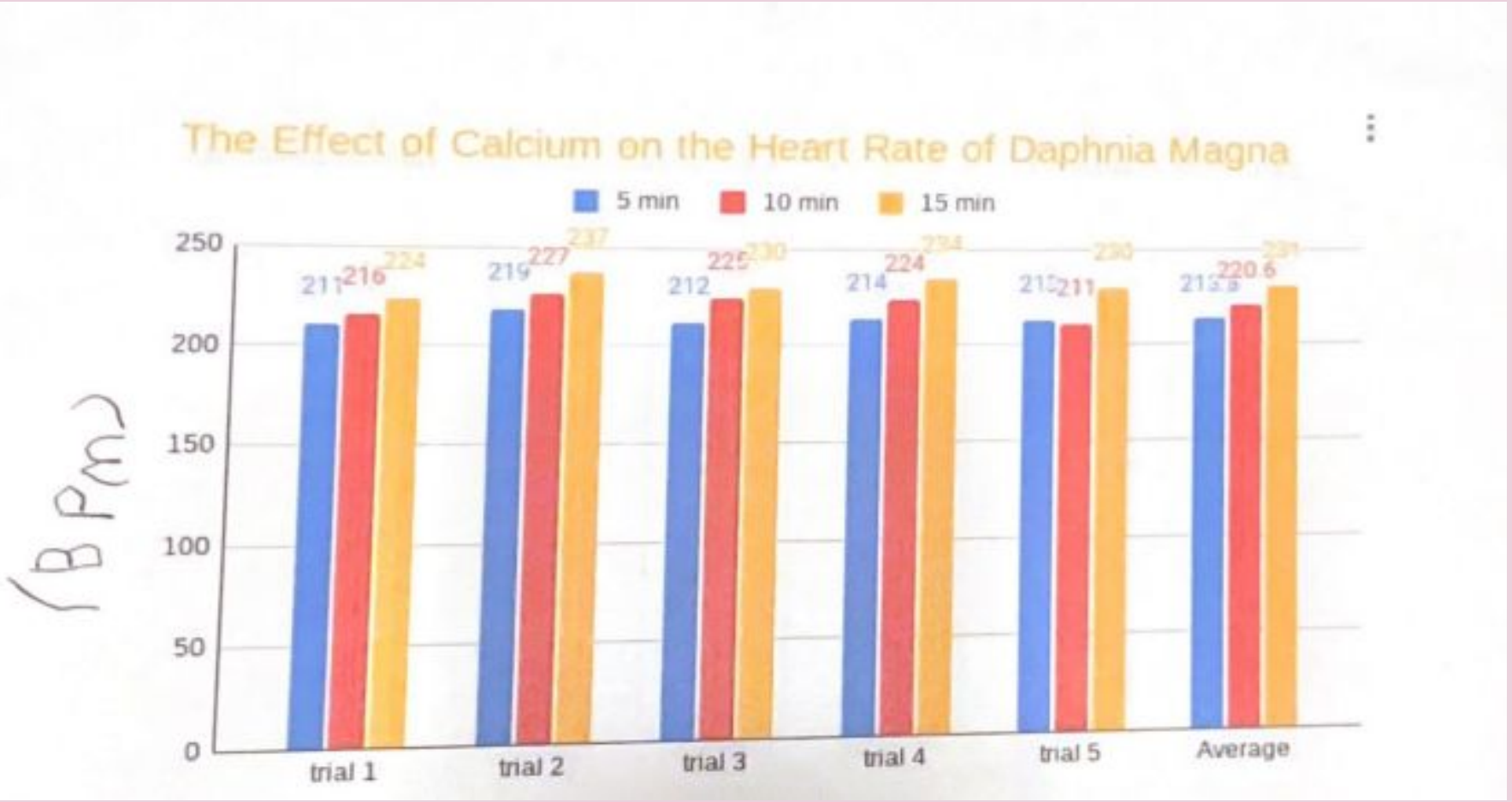


The Effect of Potassium on the Heart Rate Of Daphnia Magna




The Effect of Magnesium on the Heart Rate of Daphnia Magna
5 min
10 min
15 min
220
200
180
160
140
211
205
208
198
209
207
208
206
213
211
207
trial 1
trial 2
trial 3
trial 4
trial 5
Average

(BPM)


The Effect of Calcium on the Heart Rate of Daphnia Magna
5 min
10 min
15 min
250
200
150
100
50
0
(BPM)
211
216
224
219
227
237
212
225
230
214
224
234
211
230
220.6
trial 1
trial 2
trial 3
trial 4
trial 5
Average

Conclusion

The purpose of this experiment is to see what effect commonly used electrolytes have on heart rate. I have found that potassium and calcium will cause fast irregular heartbeats while magnesium will cause irregular and slightly lower heart rates.

While this supports my hypothesis I also found that the changes were not as drastic as I initially thought. The magnesium did not lower the heart rate as much as I thought and was quite irregular.

Other research that I have looked into shows the effects of these substances on the human heart. These findings are quite similar to mine even though I was experimenting on Daphnia Magna. After doing my experiment I did research to see why I got the results I did.

I found that Potassium helps your heart beat at the right pace but if too much is consumed it causes fast irregular heartbeats. Calcium helps the electrical system of the heart function too much and causes the heart to beat rapidly. Lastly, Magnesium was supposed to cause irregular heartbeats that slowed over time.

Abstract

the purpose of this experiment is to see the effect of commonly used important electrolytes on the heart and its system. I hypothesize that If I change the type of electrolyte then the heart rate of the daphnia will increase or decrease. I hypothesize that the potassium and calcium will cause fast irregular heartbeats while the magnesium will slow them down. To carry out this procedure I crushed 5g of each electrolyte and added them to 40g of water. Then place the daphnia Magna on a tray then record the heart rate every 5 min until 15 min. I found that potassium and calcium slightly increased the heart rate while magnesium cause irregular heartbeats that were slower than the control but also unpredictable. One thing I also noticed was that my control which had an average of about 230 heartbeats per min was much lower than the average that I found in other research. In conclusion, this experiment shows what happens to the heart when certain electrolytes are consumed and the effect they have.

Next Time....

If I were to conduct this experiment again I would first try to find ways to limit the amount of human error in the experiment. Some human error that I have found in my experiment is that I may have missed a heartbeat or the temperature of where the daphnia was located. Next time I will try to keep the daphnia at the same temperature and ensure that I am not using the same daphnia right after a trial. I would also like to find the effects of other supplements on heart rate

Risks factors

Some risks in doing this experiment include children choking on the tablets or eating them that could lead to issues in their bodys. Someone could accidentally drink the daphnia.
In my experiment I made sure that nothing was ingested. There was also a risk of the substances being absorbed through the skin so I made sure to use tools and the proper precautions

Bibliography

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Thank you!