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Effect of Spicy Samyang Noodle Consumption on Intraocular Pressure

Fakhruddin Shamsheer Barodawala*, Nurul Haziqah Izyani Awg Hj Matyassin

Faculty of Optometry and Vision Sciences, SEGi University, Petaling Jaya, Malaysia

Email address:

optom_fakhruddin@yahoo.com (Fakhruddin Shamsheer Barodawala)

*Corresponding author

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Abstract: Background: The Samyang Buldalk Bokkeummyeon or widely known as spicy Samyang Ramen is an instant spicy noodle product of South Korea which has started the spicy-eating phenomenon worldwide. Spicy food consumption also causes an effect on the body as they are stimulants that stimulate the circulation and elevate the body temperature as it will induce sweating and hence make the consumer feel cooler. Objective: The main objective of this research is to study the effect of spicy Samyang noodle consumption on Intraocular Pressure (IOP) in healthy young adults. Methods: A total of thirty (n=30) subjects between the ages of 18 to 30 with a mean age of 23.3 ± 2.5 years were recruited for this study. Subjects were required to consume a small cup of 70g of spicy Samyang Ramen. Intraocular Pressure (IOP) was measured using an i-Care TA01 Rebound Tonometer before and after 10 minutes of consumption. Results: The mean of IOP measured was 14.23 ± 2.43mmHg, increased to 15.10 ± 2.70mmHg after the spicy Samyang Ramen consumption. This increase in the IOP was statistically significant (increase by 0.9 mmHg; $p<0.05$) using paired t test. Conclusion: However, there is an increase in IOP after intake of spicy Samyang noodle, the difference is not considered clinically significant. Even so, its intake must still be taken in moderation especially in patients who have borderline high baseline IOP.

Keywords: Intraocular Pressure, Spicy Food, Ocular Hypertension

1. Introduction

In recent years, the Samyang Buldak Bokkeummyeon, or more commonly referred as spicy Samyang ramen has become a sensation globally in which the cause had been due to a unique challenge that circulated in the previous year's known as Samyang Noodle Challenge. [1] Since that encounter, the noodle has been consumed widely and new ramens with similar concept keep being produced.

Generally, food taken up by human beings either produce a therapeutic, nutritional, or even a toxic outcome on the body. As like other types of food, spicy food consumption also causes an effect on the body as they stimulate the circulation and elevate the body temperature in which it will induce sweating and hence make the consumer feel cooler. [2] Burning sensation on the skin, mucous membranes and the inside of the mouth is also the aftermath of its consumption. [3] On the other side, consumption of extremely spicy food is acknowledged to lead to detrimental effects to our digestive tract hence it is advisable to avoid such food in patients with gastrointestinal diseases. [4]

As they are many changes that can happen to the body due to the consumption of spicy food, the effects on IOP also become a concern as they were yet to be known. Thus, the purpose of this study was to inspect the linkage between spicy food consumption and IOP.

2. Materials & Methods

2.1. Patients

Healthy young adults within age range of 18 to 30 years old (23.3 ± 2.5 years old) were chosen based on random sampling method with best corrected VA at distance of 0.00 LogMAR or better and N5 at near in each eye, refractive power of spherical

equivalent of not more than -6.00D, no history of glaucoma and gastrointestinal diseases and infection, IOP of not more than 21 mmHg, not under any medications and were not diagnosed with corneal diseases. An experimental study was carried out at SEGi EyeCare, SEGi University Kota Damansara, Selangor. The study was approved by the Research Innovation and Management Center (RIMC) of SEGi University, Project Number: SEGiIRF/2020-2/FoOVS-1/77.

2.2. Preliminary Examination

Each subject underwent a preliminary examination which were measurement of their visual acuity, ocular health examination. After the inclusion criteria were met, the subjects baseline IOP (IOP_B) in both eyes before proceeding with the experiment procedure.

2.3. Methods

They were given each a small spicy Samyang noodle cup of 70g which was immersed in 200 ml of boiling water for 3 minutes which had to be consumed within 15 minutes and a 250 ml bottle water which was optional for the subjects to drink and finish. Their IOP (IOP_A) had to be measured 10 minutes after the noodle consumption even though subjects had finished the noodle earlier than the 15 minutes that was given. Subjects were asked to rest in the 10 minutes before IOP_A was measured. Both IOP measurements were taken with i-Care Tonometer between 2 pm to 5 pm in the afternoon in the same visit to avoid any diurnal variation.

3. Results

A total of 30 young subjects including 15 males and 15 females were included with the mean age of 23.3 ± 2.5 years old were recruited in the study. Results of Shapiro-Wilk test showed that all the data were normally distributed (p>0.05).

Paired t-test showed that there was no significant difference in measurement in mean IOP between RE and LE (p=0.56). Hence, only IOP measurements of RE were used for statistical analysis. To compare the IOP before and 10 minutes after the consumption, paired t-test was performed. The mean of IOP measured at baseline was 14.23 ± 2.43mmHg, increased to 15.10 ± 2.70mmHg after the spicy Samyang Ramen consumption Results showed that there was a significant increase in IOP after the consumption of the spicy Samyang noodle (p=0.003) as shown in Figure 1. However, the increment is not clinically significant. Therefore, the conclusion would be that there is no effect on IOP with the consumption of spicy food.

4. Discussion

This study aimed to investigate the effect of spicy Samyang Ramen consumption on healthy young adults. The mean IOP before consumption measured was 14.23 ± 2 mmHg and the mean IOP 10 minutes after consumption measured was 15.1 ± 3 mmHg. There was a mean increment in IOP by less than 1 mmHg before and 10 minutes after spicy Samyang noodle consumption. However, the difference is not clinically significant as the difference is only 1 mmHg. According to Singh and Shrivastava (2009), difference in IOP that would be considered as clinically significant is at least 6 mmHg. [5]

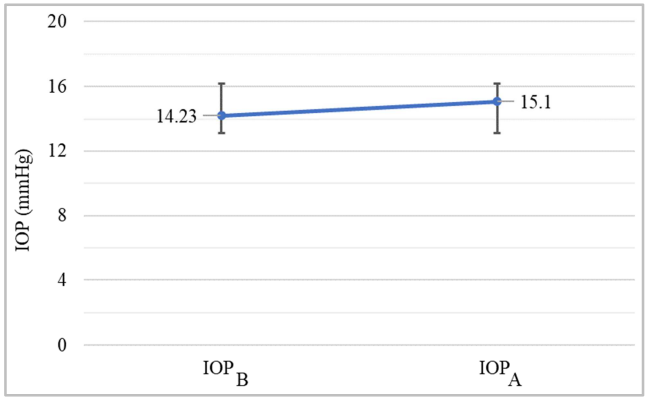

Figure 1. *Intra Ocular Pressure measured at baseline [IOP_B] and after 10 mins [IOP_A] of the spicy Samyang Ramen consumption.*

The factor that could have caused no increase in IOP after spicy food consumption would be the spicy tolerance of each individual. Spiciness of a food is caused by the addition of chili peppers or its extract and the unit to measure spicy level is expressed as Scoville Heat Unit (SHU).[6] Samyang Hot Chicken Ramen has a SHU of 4404 which is equivalent to the SHU of Jalapeño.[7] There are many people who enjoy the consumption of spicy food, and it is associated to liking and intake of spicy foods. The factor that causes the fondness of its consumption is the altering sensitivity of the TRPV 1 receptor which was proven to adapt over time after frequent and regular consumption of spicy food.[8] This specific adaptation is referred as desensitization of the TRPV 1 receptor. TRPV 1 receptor when activated causes a decrease in temperature as studied by Gavva, (2008) so subjects might not have experienced a change in body temperature.[9] As body temperature was proven to have an influence in the change of IOP [10], the null change might be the reason as to why no significant changes was found in this current study too. Therefore, it could be concluded that the desensitisation of the TRPV 1 receptor cause no changes in IOP after spicy food consumption.

Normally, while consuming spicy food, consumers tend to drink extra water to relief the burning sensation. Water drinking would lower the body temperature caused by desensitisation of TRPV 1 receptor.[9] At the same time, water drinking might balance the change in the IOP as it was found that water drinking can cause significant increase in IOP. [11] Hence, this might be another factor which may be responsible for no changes in the IOP after spicy food consumption. The balancing effect of water drinking cause null changes in IOP after spicy food consumption.

Another reason for no changes in IOP could be the release of Endorphins due to spicy food consumption. Endorphins

are happy hormones that brings feeling of happiness which gives calmness to the brain in stress situation. When spicy food is consumed, the body temperature tends to rise. [12] Spicy food consumption may cause an increase in IOP as body temperature was found to have a direct relationship with IOP. (10) However, at the same time, spicy food consumption produces release of Endorphins. [13] The release of the hormone might neutralize the increase in IOP as its release causes a subsequent reduction in IOP.[14] Thus, the null changes in IOP with spicy food consumption could be due to the neutralizing effect of Endorphins on spicy food consumption.

5. Conclusions

In conclusion, there is a significant increase in IOP after consumption of spicy Samyang noodle after 10 minutes. The difference found is not considered clinically significant. However, the long-term effect of consumption of spicy food is still unknown and deem necessary to be studied. Clinicians should inform patients at a risk on eye diseases related to IOP (e.g. Glaucoma) to be cautious on consumption of spicy food as it does elevate the IOP.

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