INTRODUCTION

Cytotoxicity is the quality of being toxic to cells. Types of venom are some examples of toxic agents or immune cell. Chemotherapy as a treatment of cancer relies on the ability of toxic agents to damage cells or to kill cells which are reproducing; this preferentially targets rapidly dividing cancer cells(8). Antibody dependent cell mediated cytotoxicity describes the cell killing ability of certain lymphocytes, which requires which required the target cells being marked by the antibody. Cytotoxicity assays are widely used by the pharmaceutical industry to screen for cytotoxicity in compound libraries. Cytotoxicity can also be measured by sulforhodamineB assay, WST assay, etc(9).

Walnut oil is an oil extracted from walnut (juglans regina). Each 100g of oil contains 63.3g of polyunsaturated fatty acid, 22.8g monounsaturated fatty acid and 9.1g saturated fatty acid. It contains no cholesterol. Unlike most nuts that are high in monounsaturated fatty acid. Walnut oil has large amount of polyunsaturated fatty acid. Particularly, alpha-linolenic acids, linolenic acids (1).

There are two types of walnut oil they are cold pressed and refined. Cold pressed walnut oil is actually more expensive due to the loss of higher percentage of oil. Refined walnut oil expeller pressed and saturated with the solvent to extract the highest percentage of the oil available in the nut meal. Walnut oil is very much rich in vitamins and minerals.(2)

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MATERIALS AND METHODS

Procurement of oil

The walnut oil was procured from Cyrus India Ltd. And further analysis was done using this oil.

Maintainence of kb cell line: The vial containing KB cell lines where procured from national centre for cell sciences (NCCS), Pune. The oral cancer cells were seeded in 24 Welles plate and kept in CO2 incubator.

Treatment of kb cell lines with drug (walnut oil)

The cells were treated with walnut oil in three different concentrations (100μl, 200 μl, 300μl) and left along for 24 hours.

Isolation of Genomic DNA

The Cells were placed in a 37°C water bath. It was continuously until the medium thawed. Then it was centrifuged at 1000rpm for 5 minutes at room temperature (5). The supernatant was discarded and cells were washed with fresh medium to remove residual DMSO(Dimethyl Sulphoxide) which is an important polar aprotic solvent that dissolves both polar and non-polar compounds and is miscible in a wide range of organic solvents as well as water. The cell pellet was re-suspended in 3ml of of DMEM(Dulbecco’s Modified Eagle’s Medium: a composition that helps in maintaining mammalian cell culture) with 10% FBS (Fetal Bovine Serum which helps in easier coagulation of cells)(6).

It was then incubated in a CO2 incubator at a humidified 37°C. The medium was changed every 2-3 days or when ph indicator (e.g. Phenol red) in medium changed colour. The culture was kept in a medium with 10% FBS until cell
RESULTS AND DISCUSSION

Cytotoxicity of walnut oil extract with increasing concentration of the oil (100, 200, 300 micrograms) was performed. The viability of the KB cell lines shows a gradual decrease as the concentration of the walnut oil is increased. This exhibits the Cytotoxicity of walnut oil extract with increasing concentration. (10)

Cytotoxicity analysis using various concentrations of walnut oil (100, 200, 300 micrograms) was performed. The viability of the KB cell lines shows a gradual decrease as the concentration of the walnut oil is increased. This exhibits the Cytotoxicity of walnut oil extract with increasing concentration. (10)

Cytotoxicity % = 100 - Viability%

**RESULTS AND DISCUSSION**

Cytotoxicity of Walnut Oil on Oral Cancer Cell Lines

CONCLUSION

From the above experiment and research it is proven that walnut oil has the potential to treat oral cancer. Walnut oil is the most commonly available product of Juglans regia and is easily available in the market. Though research is still proceeding in various parts of the world to make use of this plant extract to treat cancer, oral-cancer in specific, there is less awareness among the masses.(3) In near future the phytochemical properties of walnut oil may be used to design anti-cancer drugs. Also the medicinal property of the various natural herbs should be explored because than the other chemotherapeutic drugs, they don’t affect the normal and healthy cells and they don’t cause any side effects.

**References**

1. D.J. Undersander, E.A. Oelke, A.R. Kaminski, J.D. Doll, D.H. Putnam, S.M. Combs, and C.V. Hanson (1990). “Walnut”. Alternative Field Crops Manual.
2. “Walnut Oil for Nails: Natural Care for Your Perfect Manicure”. Body (personal) care.
3. P. E. Petersen, “Oral cancer prevention and control—the approach of the World Health Organisation,” Oral Oncology, vol. 45, no. 4-5, 2009, 454-460.
4. T. Tanaka, “Chemoprevention of oral carcinogenesis,” European Journal of Cancer Part B: Oral Oncology, vol. 31, no. 1, 1995, 3-15.
5. T. Tanaka, “Effect of diet on human carcinogenesis,” Critical Reviews in Oncology/Hematology, Vol. 25, no. 2., 1997, 73-95.
6. T. Tanaka, “Chemoprevention of human cancer: biology and therapy,” Critical Reviews in Oncology/Hematology, vol. 25, no. 3, 139-174, 1997.
7. Rajkumar Paul, Murari Prasad & Nand K. Sah (2011) Anticancer biology of Azadirachta indica L (neem): A mini review, Cancer Biology & Therapy, 12:6, 467-476, DOI: 10.4161/cbt.12.6.16850.
8. Mosmann T. Rapid colorimetric assay for cellular growth and survival: application to proliferation and cytotoxicity assays. J Immunol Methods. 1983; 65:55-63. [PubMed]
9. Kumbhare MR, Guleha V, Sivakumar T. Estimation of total phenolic content, cytotoxicity and invitro antioxidant activity of stem bark of Moringa oleifera. Asian Pac J Trop Dis. 2012;2(2):144-150.
10. Mahavorasirikul W, Viyanant V, Chaijaroenkul W, Itharat A, Na-Bangchang K. Cytotoxic activity of Thai medicinal plants against human cholangiocarcinoma, laryngeal and hepatocarcinoma cells in vitro. BMC Complement Altern Med. 2010; 10:55. [PubMed]