The Effect of Cold Atmospheric Plasma in Bladder Cancer Cells

**Introduction**

Bladder cancer (BC) is a solid tumor with high recurrence rates. It is the sixth tumor with the highest incidence and the eighth one with the highest mortality in the world.

Plasma is one of the physical states of matter, in which a certain portion of the particles is ionized. Its use in medicine is an emerging field that has grown rapidly.

**AIM:** To evaluate the effect of cold atmospheric plasma (CAP), namely cytotoxicity and the oxidative stress, in a human bladder cancer cell line.

**Material and Methods**

**Cell Culture:**
- Cell lines: HT1376 and TCCSUP
- DMEM
- 5% FBS
- 95% air and 5% CO₂, 37°C

**Methods:**

1. **Evaluation of metabolic activity:**
2. **Evaluation of protein content:**
3. **Evaluation of oxidative stress and antioxidant defense:**

**Results**

**I. Evaluation of metabolic activity:**

[Graphs and data showing metabolic activity in different conditions]

Decrease of metabolic activity for both cell lines

**II. Evaluation of protein content:**

[Graphs and data showing protein content in different conditions]

Decrease of protein content for both cell lines

**III. Evaluation of oxidative stress and antioxidant defense:**

- a) Intracellular production of peroxides:
- b) Intracellular production of radical superoxide:
- c) GSH levels:

Increase of intracellular production of radical superoxide for TCCSUP cell line

No significant difference in expression of GSH levels for both cell lines

**Conclusions**

Cytotoxicity results show that CAP treatment was able to induce a significant reduction of total protein content and metabolic activity even after short periods of exposure. These outcomes obtained encourage further studies. CAP can potentially offer a minimally-invasive option that allows specific cell removal without interfering with the whole tissue.

**On Going**

1. **Tumor cell lines:**
   - HT1376
   - TCCSUP
   - Flow Cytometry: Types of cell death
   - Mitochondrial membrane potential

2. **Normal cell line:**
   - HCY-29
   - Citotoxicity assays: MTT
   - SRB