

# Intraperitoneal perfusion with sodium bicarbonate solution can significantly increase the lifespan of mice with Ehrlich ascites carcinoma

A.A. Bogdanov, N.A. Verlov, N.A. Knyazev, V.V. Klimenko, A.A. Bogdanov, V.M. Moiseyenko  
St. Petersburg Clinical Scientific and Practical Center of Specialized Types of Medical Care (Oncological), St. Petersburg, Russia

## Background

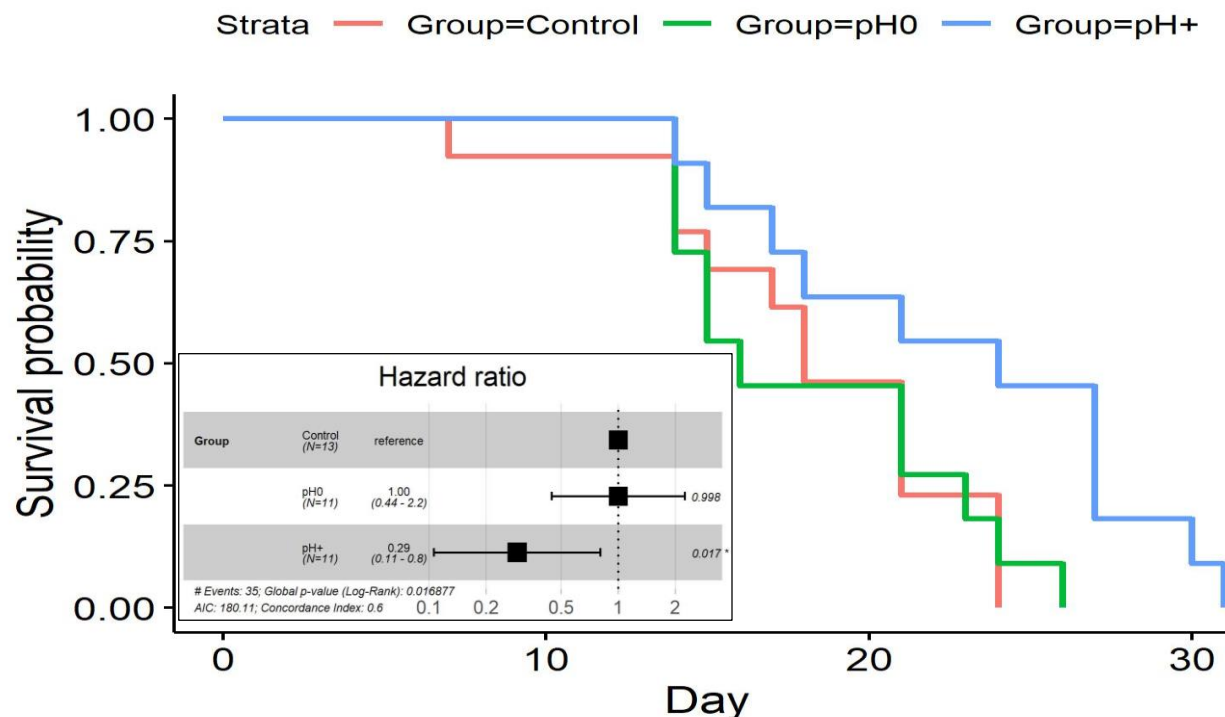
Malignant ascites is associated with a short life expectancy and one of the main complications in patients with peritoneal carcinomatosis originating from various cancers. Paracentesis is a useful procedure for the control of acute symptoms, or in those patients who are resistant to diuretics. It provides relief in about 90% of cases. Otherhand, a major drawback of paracentesis is early recurrence of ascites, because paracentesis does not address the mechanisms resulting in formation of ascites and not lead to increase of overall survival.

## Methods

ICR (CD-1) mice were intraperitoneal injected with  $6 \times 10^5$  Ehrlich carcinoma cells suspended in 0.2 ml of PBS solution. At day 7 after tumor injection mice were intraperitoneal perfused with 0.9 % sodium chloride solution (SC) in group pH0 (n=11) or with 1 % sodium bicarbonate solution containing 0.9 % sodium chloride (SB) in group pH+ (n=11). Mice in control group (n=13) were intact. The perfusion procedure consisted of tumor ascites evacuation, double intraperitoneal administration of 10 ml SC or SB with 10 minutes incubation followed by evacuation, intraperitoneal washing with 0.9 % SC. Cell concentration in ascites and pH was measured.

## Results

The ascites pH values were  $6.9 \pm 0.1$  in all groups. Cell concentrations at day of perfusion, on the 7<sup>th</sup> and 11<sup>th</sup> days after were around 100, 200 and  $300 \times 10^6$  cells per ml respectively in all groups but ascites volume was visually lower in pH+ group. **Mice had median survival of 24 days in pH+ group, which was significantly different from median survival of 17 days in group pH0 and control ( $p < 0.05$ ).**



**Figure.** Kaplan-Meier curves of overall survival in the Control group (Control, red), SC group (pH0, green), SB group (pH+, blue). Insertion: hazard ratio calculated. 0 day – injection of Erlich carcinoma cells, 7 day – intraperitoneal perfusion with SC or SB.

## Conclusion

We may suggest that intraperitoneal perfusion with sodium bicarbonate solution could be effective alternative to paracentesis or addition to HIPEC in palliative care of malignant ascites.