Carbogen gas to improve the outcome of radiotherapy

A Phase Ib/II trial of Prostate Radiotherapy in Conjunction with Carbogen and Nicotinamide (PROCON)

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## Oxygen and Radiotherapy

<table>
<thead>
<tr>
<th></th>
<th>Number of Trials</th>
<th>Number of Patients</th>
<th>Improvement in outcome (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local Control</td>
<td>56</td>
<td>7879</td>
<td>21% (12 – 30%)</td>
</tr>
<tr>
<td>Survival</td>
<td>64</td>
<td>9597</td>
<td>13% (4 – 21%)</td>
</tr>
</tbody>
</table>

Low Oxygen levels in the Prostate

Evidence exists that confirms the presence of clinically significant regions of low oxygen levels within human prostate tumours
Low Oxygen Levels – Poor Prognosis

The oxygen level at diagnosis correlates with outcome following radiotherapy.
High Oxygen content gas breathing can influence the oxygenation of prostate tumours in animal models and man – based on imaging data.

64% patients had a significant reduction in $R_2^*$ with a mean reduction of 21.6% ($P=0.0005$).
Oxygenation changes during Carbogen breathing

Before Carbogen  During Carbogen  10 mins post Carbogen
Carbogen Breathing
Carbogen Breathing
Trial Outcomes

- We are measuring the effectiveness of the radiotherapy in conjunction with Carbogen gas breathing and Nicotinamide tablets.
- In addition we are assessing whether oxygen enhancement increases the toxicity of treatment.
BCON Trial

Overall survival

Experimental arm
Control arm

Time from randomization (months)

Overall survival (%)
Acknowledgements

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