Household Radon Exposure In Patients Attending A Rapid Access Lung Cancer Clinic

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BACKGROUND

- Radon is a colourless, odourless radioactive gas, which is naturally released into the atmosphere from uranium degradation in rocks and soil
- Along with cigarette smoking and asbestos, radon is classed as a level 1 carcinogen by the World Health Organisation1
- Radon has a half-life of 3.8 days, allowing it to diffuse through soil into the air and accumulate in buildings where it can reach dangerously high concentrations
- It is inhaled into the lungs and decays with the emission of alpha particles, bombarding bronchial epithelium and causing DNA damage
- Household radon exposure delivers a larger dose of ionizing radiation to the public than any other source
- Long term radon exposure is the second commonest cause of lung cancer in smokers, and the commonest cause amongst never smokers2
- In a survey of 29 OECD countries, Ireland was found to have the 8th highest average radon levels at 89 Bq/m³, estimated to cause 13% of lung cancers per year
- Radon is however a worldwide problem and is thought to account for 21,000 lung cancer cases in the United States each year3
- There is a strong synergism with smoking exposure, with current and former smokers at highest risk of a radon induced lung cancer

STUDY

- Galway (West of Ireland) has High Radon Areas (Fig 1)
- A rapid access lung cancer evaluation service (RALC) is provided by Galway University Hospital
- Using the RALC we sought to measure:
  i. Household radon exposure in 50 consecutive patients attending RALC
  ii. Percentage of houses above the national reference range (200Bq/m³) requiring remediation
  iii. Patient awareness of radon as a lung cancer risk
  iv. Viability of using the RALC as a radon screening service

RESULTS

Table 1: Baseline Characteristics (n=42)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>Male</td>
<td>52%</td>
</tr>
<tr>
<td>Mean age (range)</td>
<td>64.2 years (38-86)</td>
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<tr>
<td>Current smokers</td>
<td>19%</td>
</tr>
<tr>
<td>Former smokers</td>
<td>60%</td>
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<tr>
<td>Mean pack years</td>
<td>32.2 years</td>
</tr>
<tr>
<td>Never smokers</td>
<td>21%</td>
</tr>
<tr>
<td>Consecutive years in household</td>
<td>26.9 years (5-60)</td>
</tr>
</tbody>
</table>

- 50 consecutive patients attending RALC agreed to partake in the study.
- 42 (84%) completed the study
- Only 19% were current smokers but 79% were ever smokers
- 21% had high radon levels
- There was a very poor understanding of radon risk

CONCLUSIONS

- Our study highlights a low rate of radon testing and scant awareness of radon as a lung cancer risk, despite being conducted in areas of targeted media campaigns in the past
- The percentage of houses above the national reference range was consistent with larger surveys of the area previously published
- Patients were receptive to radon information and study completion rates were high (82%)
- Some experts have advocated targeting radon testing in those most at risk, i.e. current and former smokers3
- Tailoring advice in radon remediation and smoking cessation should increase the proportion of homes that remediate and lower overall lung cancer risk
- Many governmental bodies have called for combined public health campaigns4, and greater involvement of health professionals in delivering this message is vital
- Rapid Access Lung Cancer Clinics have an important role, and provide a framework to reduce radon exposure and the incidence of radon induced lung cancer

REFERENCES

1. WHO handbook on indoor radon: a public health perspective, WHO 2009

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