Childhood Cancer 2012

Alan Craft
April 2012
Rudolf Virchow
Virchow -1821-1902

A German doctor, anthropologist, public health activist, pathologist, prehistorian, biologist and politician

He is referred to as the “Father” of pathology

Worked in Charite Hospital, Berlin

Credited with one of the first descriptions of leukaemia
Virchow - 1858

“Omnis cellula e cellula”
Every cell originates from another existing cell like it
In the history of all the known cases of leukaemia we only find it once as yet recorded that the patient left the hospital in improved health.

I do not wish by any means to infer that the disease is absolutely incurable.

I hope that for it remedies will at length be discovered.

1858
Programme
• Setting the Scene
• Prognosis
• Genetics and Epigenetics
• Birth Characteristics
• Air Pollution and Smoking
• Chemical Exposures
• Non Ionising Irradiation
• Mobile Phones
• Ionising Radiation
• Infection and Immunity
• Reducing Risks
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Childhood Cancer

Ten-Year Survival Rates

10-year survival (%)

Year of diagnosis

Survival of patients diagnosed 1966-2000, by period of diagnosis

Fig 5.14 Total cancers
Survival increasing at 1.5% per year
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Prevalence and diversity of constitutional mutations in the p53 gene among 21 Li-Fraumeni families.

Cancer Research
1994;1298-1304
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• Craft AW, Parker L, Stiller C, Cole M.
  Screening for Wilms' tumour in patients with aniridia, Beckwith syndrome, or hemihypertrophy.
  Medical and Pediatric Oncology 1995;24:231-234.

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  Screening for Wilms’ tumor in children with Beckwith-Wiedemann syndrome or idiopathic hemihypertrophy.
  Medical and Pediatric Oncology 1999;32:196-200

  Surveillance for Wilms tumour in at-risk children: pragmatic recommendations for best practice
  Archives of Disease in Childhood 2006, 91:995-999

• Richard H Scott, Jenny Douglas, Linda Baskcomb, Nikki Huxter, Karen Barker, Sandra Hanks, Alan Craft, Mary Gerrard, Janice A Kohler, Gill A Levitt, Sue Picton, Barry Pizer, Milind D Ronghe, Denise Williams, Factors Associated with Childhood Tumours (FACT) Collaboration, Jackie A Cook, Pascal Pujol, Eamonn R Maher, Jillian M Birch, Charles A Stiller, Kathy Pritchard-Jones & Nazneen Rahman
  Constitutional 11p15 abnormalities, including heritable imprinting center mutations, cause nonsyndromic Wilms tumor.
  Nature Genetics 2008;40(11):1329 -1334
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UV exposure
• **Basta NO**, James PW, Craft AW, McNally RJ. Seasonal variation in the month of birth of teenagers and young adults with melanoma suggests the involvement of early life UV exposure. *Pigment Cell and Melanoma Research* 2010;24;250-253
<table>
<thead>
<tr>
<th></th>
<th>Total melanoma patients</th>
<th>Male melanoma patients</th>
<th>Female melanoma patients</th>
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<tbody>
<tr>
<td></td>
<td>N</td>
<td>Heterogeneity P-value</td>
<td>Sinusoidal P-value</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Month of birth</td>
<td>210</td>
<td>0.37</td>
<td>0.23</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Month of diagnosis</td>
<td>210</td>
<td>0.77</td>
<td>0.39</td>
</tr>
</tbody>
</table>

\(^1\) Statistically significant result \(P < 0.05\)
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- UK Childhood Cancer Study Investigators
  Exposure to power-frequency magnetic fields and the risk of childhood cancer.

- UKCCSG Investigators
  Exposure to power frequency electric fields and the risk of childhood cancer in the UK>
  British Journal of Cancer (2002) 87, 1257-1266
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British Medical Journal 1993;307:966-971

• Parker L, Pearce MS, Dickinson HO, Aitkin M, Craft AW

Stillbirths among offspring of male radiation workers at Sellafield nuclear reprocessing plant.

The Lancet: Vol. 354 1999; 1414-1407
Radiation exposure

Natural background  1 mSv per year
Single CT  7-9mSv
• Socio-economic variation in CT scanning in Northern England, 1990-2002
  BMC Health Services Research. 2012;12-24

• Development of a database of organ doses for pediatric and young adult CT scans in the United Kingdom
  Kim, KwangPyo; Berrington de Gonzalez, Amy; Pearce, Mark; Salotti, Jane; Parker, Louise; McHugh, Kieran; Craft, Alan; Lee, Choonsik
• Radiation protection dosimetry; in press
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• McGill AC, Seviour JA, Dale G, Craft AW.  
  Screening for neuroblastoma by gas chromatography - mass spectrometry in the Northern region.  

Parker L, Craft AW.  
Neuroblastoma screening: More questions than answers.  

• Murphy SB, Cohn SL, Craft AW, Woods WG, Sawada T, Castleberry RP, Levy HL, Prorok PC, Hammond GD.  
  Do children benefit from mass screening for neuroblastoma?  
  Lancet 1991;337:344-346

  Screening for neuroblastoma in the north of England.  
  British Medical Journal 1992;305:1260-1263
But what caused it doctor?