ANAEMIA IN CANCER PATIENTS UNDERGOING RADIOTHERAPY AND CHEMOTHERAPY AT THE NATIONAL HOSPITAL ABUJA, NIGERIA

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OUTLINE OF THE PRESENTATION

- Background
- Introduction
- Objectives
- Methodology
- Findings
- Conclusion and Recommendations
- Limitations
- Selected references
- Acknowledgement
BACKGROUND: NIGERIA 1/2

- Nigeria population was estimated at 186 million people (NPC National Population Commission 2017)
- This figure means that Nigeria represent about 2.35% of the world population
- Nigeria contributes about 20 – 30% of the world cancer mortality (IARC 2008)
- There are 7 Radiation Oncology Centers with Mega Voltage Radiotherapy machines serving this 186 million population.
- Nigeria lacks population-based cancer registry hence most of the data on cancer incidence, mortality, morbidity and prevalence studies were hospital-based cancer registry
Institute of Human Virology of Nigeria (IHVN) analyzed data from 11 Hospital Based Cancer Registry Programme in Nigeria from 2009-2010. The study revealed that the commonest five cancers in males and females were as follows:

**% distribution for Males**
- Prostate: 29.20%
- Colorectal: 6.80%
- Lymphomas: 7.00%
- Liver: 4.00%
- Skin: 3.80%

**% distribution for females**
- Breast: 40.40%
- Cervix: 2.10%
- Ovary: 3.10%
- Lymphomas: 3.70%
- Skin: 17.30%
INTRODUCTION 1/3

- Anaemia is one of the predisposing factors to poor patient outcome in cancer treatment
- More than 50% of cancer patients will receive Radiotherapy or Chemotherapy in the course of their treatment
- It has been difficult to establish global or National benchmark on the baseline haemoglobin of patients selected for cancer therapy especially at different stages of the tumours
- Various centers use different levels but there is a need to establish a national cut-off point
- Establishing a uniform benchmark will inform a global best practice and increase the patient’s outcome and quality of life
Ludwig et al. 2004 examined 9,118 cancer patients using Hb concentration level less than 12g/dl as the baseline value to study frequency of anaemia in various cancer types.
Also, studies done by Ludwig et al 2004 on anaemia prevalence in patients receiving different cancer treatments with anaemia defined as Hb concentration level less than 12g/dl was quite significant.
OBJECTIVES:

- The aim of the study was to carry out a prospective study on pattern of anaemia in cancer patients undergoing Radiotherapy and Chemotherapy.
METHODOLOGY 1/2

- A Hospitals Based prospective study
- The study was approved by Research and Ethics Committee, National Hospital Abuja, Nigeria.
- 201 patients with solid malignances with intent for radical treatment were recruited within a period of 8 months
- All the participants gave their informed consent, demographic characteristics and their oncologic diseases were gathered.
- Patient’s baseline or pretreatment haemoglobin (Hb) were measured on the first day of consultation
- The Hb level of the participants were measured once every 2 weeks in the course of radiotherapy and chemotherapy
- The whole process was terminated after 3 consecutive haemoglobin reading or after week 6
Anaemia was classified for this study into:

- Less than 10g/dl - Severe anaemia
- 10 - 10.9g/dl - moderate anaemia
- 11 – 11.9 g/dl - mild anaemia
- 12 g/dl and above - no anaemia.
## Demography of the study population

<table>
<thead>
<tr>
<th>Age group</th>
<th>Chemotherapy Number (%)</th>
<th>Radiotherapy Number (%)</th>
<th>Chemo-radiotherapy Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 – 34</td>
<td>17 (17.0)</td>
<td>11 (17.5)</td>
<td>7 (18.4)</td>
</tr>
<tr>
<td>35 – 44</td>
<td>36 (36.0)</td>
<td>19 (30.2)</td>
<td>9 (27.7)</td>
</tr>
<tr>
<td>45 – 64</td>
<td>22 (22.0)</td>
<td>10 (15.9)</td>
<td>8 (21.1)</td>
</tr>
<tr>
<td>55 – 64</td>
<td>21 (21.0)</td>
<td>11 (17.5)</td>
<td>10 (26.3)</td>
</tr>
<tr>
<td>65 – 74</td>
<td>3 (3.0)</td>
<td>8 (12.7)</td>
<td>3 (7.9)</td>
</tr>
<tr>
<td>75+</td>
<td>1 (1.0)</td>
<td>4 (6.3)</td>
<td>1 (2.6)</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>63 (100)</td>
<td>38 (100)</td>
</tr>
</tbody>
</table>
Demography of the study population based on sex distribution.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Chemotherapy</th>
<th>Radiotherapy</th>
<th>Chemo radiotherapy</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>12</td>
<td>12.0</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>7.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>11</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>28.9</td>
</tr>
<tr>
<td>Female</td>
<td>88</td>
<td>88.0</td>
<td>58</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>92.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>27</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>71.1</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>63</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>100</td>
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<td></td>
<td></td>
<td>38</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>
Percentage Distribution of Tumour site and treatment type

**Chemotherapy**
- Breast: 68%
- Gastrointestinal: 6%
- Head and Neck: 5%
- Urogenital: 3%
- Gynaecological: 6%
- Musculoskeletal (Sarcomas): 6%
- Lung: 4%

**Chemoradiation**
- Breast: 0%
- Gastrointestinal: 0%
- Head and Neck: 0%
- Urogenital: 0%
- Gynaecological: 0%
- Musculoskeletal (Sarcomas): 36.20%
- Lung: 63.20%

**Radiotherapy**
- Breast: 0%
- Gastrointestinal: 0%
- Head and Neck: 0%
- Urogenital: 0%
- Gynaecological: 0%
- Musculoskeletal (Sarcomas): 22.20%
- Lung: 47.60%

**FINDINGS 3/8**
Tumor stage and treatment type percentage distribution

FINDINGS 4/8

Chemoradiation
Chemotherapy
Radiotherapy
FINDINGS 5/8

Table showing WHO performance status of the studied patients

<table>
<thead>
<tr>
<th>Therapy</th>
<th>WHO PERFORMANCE STATUS</th>
<th>Male</th>
<th>Female</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiotherapy</td>
<td></td>
<td>3</td>
<td>35</td>
<td>2</td>
<td>23</td>
</tr>
<tr>
<td>Chemotherapy</td>
<td></td>
<td>8</td>
<td>40</td>
<td>4</td>
<td>48</td>
</tr>
<tr>
<td>Chemoradiation</td>
<td></td>
<td>5</td>
<td>17</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>16</td>
<td>92</td>
<td>12</td>
<td>81</td>
</tr>
</tbody>
</table>
THE TREND OF HB CHANGES BY WEEKS

Chemoradiation

Chemotherapy

Radiotherapy

FINDINGS 6/8
# FINDINGS 7/8

Distribution of Means and Standard Deviation of HB by Sex and type of treatment

<table>
<thead>
<tr>
<th>Sex</th>
<th>Chemotherapy Mean, g/dl (SD)</th>
<th>Radiotherapy Mean, g/dl (SD)</th>
<th>Chemoradiation Mean, g/dl (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>11.72 (0.88)</td>
<td>10.82 (0.95)</td>
<td>12.27 (1.39)</td>
</tr>
<tr>
<td>Female</td>
<td>11.65 (1.21)</td>
<td>12.14 (1.02)</td>
<td>11.13 (1.14)</td>
</tr>
<tr>
<td>95% C.I Mean difference</td>
<td>0.07 ± 2.73</td>
<td>-1.32 ± 2.73</td>
<td>1.14 ± 3.52</td>
</tr>
<tr>
<td>t</td>
<td>0.53</td>
<td>-2.96</td>
<td>2.41</td>
</tr>
<tr>
<td>P-value</td>
<td>p&gt;0.05 (NS)</td>
<td>p&gt;0.05 (NS)</td>
<td>p&gt;0.05 (NS)</td>
</tr>
</tbody>
</table>
## FINDINGS 8/8

Distribution of mean HB, Standard deviation and confidence interval by type of treatment

<table>
<thead>
<tr>
<th>Types of Treatment</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Week 0</td>
<td>Week 2</td>
</tr>
<tr>
<td>Chemotherapy</td>
<td>13.42</td>
<td>12.42</td>
</tr>
<tr>
<td>Radiotherapy</td>
<td>12.55</td>
<td>12.18</td>
</tr>
<tr>
<td>Chemo radiotherapy</td>
<td>12.34</td>
<td>11.78</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>95% C.I</th>
<th>Chemotherapy</th>
<th>Radiotherapy</th>
<th>Chemo radiotherapy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 0</td>
<td>12.12 – 12.85</td>
<td>12.31 – 12.80</td>
<td>12.17 – 12.52</td>
</tr>
<tr>
<td>Week 2</td>
<td>11.10 – 11.91</td>
<td>11.93 – 12.42</td>
<td>11.59 – 11.97</td>
</tr>
<tr>
<td>Week 4</td>
<td>9.91 – 10.95</td>
<td>11.73 – 12.31</td>
<td>11.11 – 11.51</td>
</tr>
</tbody>
</table>
CONCLUSION AND RECOMMENDATIONS

• Prevalence of anaemia in the study was 63%
• While pre-treatment Hb level measurement is very important, it is the on-treatment Hb level that is very critical as patients with initial adequate Hb value may easily be tilted into anaemia as their treatment progress
• At 95% confidence interval, evaluation of effect of therapy on Hb level in the three arms showed that none of the values reached statistical significance ie P-value < 0.05
• However, the impact of Chemotherapy on Hb level was more significant than in other treatment arms, hence Chemotherapy – 9.60-10.62g/dl, Radiotherapy 11.52-12.13g/dl, and Chemoradiation 10.98-11.36g/dl
• We recommend a benchmark of 11g/dl minimum for any patient being selected for both radiotherapy, chemotherapy and chemoradiation in Nigeria
LIMITATIONS

- Paucity of published work on trends of Hb in cancer patients in Nigeria
- Challenges of generalization of the findings (Urban-Rural variations)
- Stage of the tumours at the point of recruiting them into the study
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SELECTED REFERENCES:

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THANK YOU FOR LISTENING