Quality Outcomes in Colon Cancer
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Background
In the United States, colon cancer is the second leading cause of cancer-related deaths among men and women combined. However, there has been a decline in the death rate associated with colorectal cancer as attributed to early detection of pre-cancerous polyps with routine screening colonoscopy. Additionally, studies have shown that adherence to National Comprehensive Cancer Network (NCCN) guidelines is associated with better patient outcomes.

References

Methods
A retrospective study was initiated to assess the adherence of pre and postoperative management of non-metastatic colon cancer patients to current national guidelines. A query of the Watson Clinic Cancer & Research Center Cancer Registry was completed to provide a list of patients diagnosed with stage II and III colon cancer who had been treated at the Watson Clinic Cancer & Research Center between 1/1/2015 – 12/31/2018. The retrospective review of 104 Watson Clinic patients with non-metastatic, early stage colon cancer was performed to determine if they received:

- Appropriate pre-operative evaluation
- Adequate post-operative management based on stage of the disease
- Surgical resection
- Appropriate adjuvant chemotherapy

NCCN guidelines were used as a benchmark.

Results

Demographic and baseline patient characteristics:
- Younger patients were more likely to present with stage II low-risk disease (88.4% of stage II low-risk patients were <70 years old).
- A family history of colon cancer was identified in 14.4% of patients.

Postoperative Evaluation Compliance
The highest compliance for preoperative evaluation was exhibited by stage II high-risk patients with 88.9% receiving both labs and imaging.

Postoperative Adjunct Therapy Administration
The administration of adjuvant chemotherapy is recommended for stage II high-risk and stage II patients. 15.8% of stage II low-risk patients had close surgical margins and were treated as high-risk.

Preoperative Evaluation Compliance

<table>
<thead>
<tr>
<th>Patient</th>
<th>Stage II Low Risk</th>
<th>Stage II High Risk</th>
<th>Stage III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>None</td>
<td>At least one</td>
<td>Both</td>
</tr>
<tr>
<td>Adherent</td>
<td>45.4%</td>
<td>14.2%</td>
<td>27.4%</td>
</tr>
<tr>
<td>Undertreatment</td>
<td>15.0%</td>
<td>12.5%</td>
<td>10.9%</td>
</tr>
<tr>
<td>Overtreatment</td>
<td>39.6%</td>
<td>73.3%</td>
<td>51.7%</td>
</tr>
</tbody>
</table>

Postoperative Adjunct Therapy Initiation Timeframe
Initiation of chemotherapy should be within 12 weeks of surgery. 97.9% of patients treated with adjuvant chemotherapy were treated within this timeframe.

Postoperative Adjunct Therapy Adherence Comparison
- The highest rate of compliance for post-operative management was demonstrated by the stage II low-risk cohort, whereas the lowest rate was demonstrated by the stage II high-risk cohort. The compliance rate for stage III patients most closely resembled the NCCN adherence estimates. Watson Clinic compliance percentages far exceed the NCCN estimates for stage II low-risk colon cancer patients.

Similar studies reviewing the adherence to stage-specific treatment guidelines for patients with colon cancer based the definition of adherence on whether postoperative chemotherapy was actually recommended by the clinician as documented in the medical records, independent of whether the patients actually received chemotherapy. If a similar definition of adherence were used in this analysis, adherence rates to NCCN guidelines would significantly improve as demonstrated in the graph below which highlights MD adherence to NCCN in comparison to patient adherence.

Discussion, Conclusions and Future Research
Reasons for Postoperative Adjunct Chemotherapy Nonadherence
Understanding why adjuvant chemotherapy was not administered to some of the stage II high-risk and stage III colon cancer patients is informative. Reasons included: patient declining treatment and opting for routine surveillance, adjuvant chemotherapy not being recommended due to patient age or comorbidities, patients receiving care elsewhere or passing away before receiving treatment, or the patient being diagnosed at the end of the study time period.

Conclusions
- In addition to the above, the lower adherence to NCCN guidelines for stage II high-risk patients may further be attributed to poor risk assessment in differentiating between the two stage II risk categories, and also related to physicians educating patients that though adjuvant chemotherapy is standard of care, there is only a small benefit of adjuvant chemotherapy in stage II colon cancer patients as it relates to disease free survival and overall survival. The data supporting adjuvant chemotherapy in stage II colon cancer is strong and compelling.

In order to further improve adherence of NCCN guidelines for management of stage II and III colon cancer patients the following has been initiated in our current practice:

a) A pathology checklist for stage II risk assessment (low vs. high) has been implemented to better distinguish which stage II colon cancer patients should receive adjuvant chemotherapy treatment. Additionally, emphasizing the role of adjuvant chemotherapy in stage II high-risk disease as it pertains to progression free survival and overall survival is critical. Clinical studies evaluating the absolute benefit of chemotherapy in stage II high-risk colon cancer patients are needed so as to have more compelling evidence for patients about the importance of adjuvant chemotherapy.

b) Multidisciplinary approach in which the responsibilities of each healthcare provider is delineated so that these patients will have appropriate preoperative testing and postoperative management.

Future Research
Further studies evaluating adherence to NCCN guidelines and patient outcomes with 5-year survival data using the same patient cohort should be conducted. Additionally, after implementing the multidisciplinary approach and using the risk assessment checklist, a re-evaluation of the rate of adherence to NCCN guidelines should be conducted.

Acknowledgements:
Watson Clinic Cancer Registry
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