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Prognostic importance of Thrombopoietin after radiotherapy: a prospective study

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Introduction: Recent studies show that thrombopoietin has a significant prognostic value after cancer therapy.

Material & Method: In a prospective study 45 cases (30 male and 15 female) of gastrointestinal cancer were taken, which were undergone surgery. It included the cases without (34) and with (11) prior radiotherapy. TPO and platelet count were measured on day 1 preoperatively and day 3 after surgery.

Result: At base level prior to surgery lower value of TPO was noted in the group, who were not given RT (174.8 ± 98.2 pg/ml) than the group who were given RT (220.3 ± 120.7 pg/ml), although it was not statistically significant (p-value 0.2). Day 3 after surgery the TPO value in the cases without RT was 287.2 ± 177.3 pg/ml and that of in the cases who received RT was 472.6 ± 265.2 pg/ml. This difference was statistically significant (p-value 0.01). The corresponding platelet counts preoperatively were 1.86 ± 0.89 lakh/ cmm and 1.9 ± 0.62 lakh/ cmm (p-value 0.72). The corresponding platelet counts post-operatively were 1.52 ± 0.53 lakh/ cmm and 1.06 ± 0.51 lakh/ cmm (p-value 0.02). Similar to TPO value postoperatively difference in platelet count was also statistically significant.

Discussion: In the cases after surgery following RT, TPO level was seen higher than in the cases who underwent surgery without RT. After surgery there was sharp rise in TPO level among the patients who were already treated with RT, than the group who were not treated with RT. This difference was statistically significant. The platelet count in all these conditions correlated well with the level of TPO.

Votsadakis IA 2014 showed thrombocytosis as an adverse prognostic factor in gastrointestinal cancers. There was significant association with stage III & IV, but not in stages I & II of esophageal cancer. Better overall survival was seen in cases of gastric and colorectal cancer cases having normal platelet count than thrombocytosis (1).

Wang et al 2015 studied the role of rHuTPO on mice after radiation exposure. There was marked proliferation of Hemopoietic Stem Progenitor Cell with improved survival (2).

Conclusion:

- Higher TPO level after surgery or radiotherapy is an indicator of better response.
- Thrombocytosis prior to therapy indicates poor prognosis
- Level of TPO correlates well with platelet count after surgery
- Therapeutic value of rHuTPO in human after RT needs further evaluation

1. Votsadakis IA, Thrombocytosis as a prognostic marker in gastrointestinal cancers, *World J of GastrointestOncol.* 2014 Feb 15; 6(2): 34–40.
2. Wang C, Zhang B, Wang S, Zhang J, Liu Y, Wang J Recombinant human thrombopoietin promotes hematopoietic reconstruction after severe whole body irradiation, *Scientific Reports* 5, Article number: 12993 (2015)

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