

Introduction

- Blood transfusion services have a crucial role in management of patient undergoing elective surgeries and are an integral part of the healthcare system.
- Although blood ordering is common practice in surgical field, the average requirement for particular procedure is usually based on subjective anticipation of blood loss rather than evidence based estimates.
- Crossmatch to transfusion (CT) ratio, Transfusion index (TI) and Transfusion probability (TP) are an important quality indicator used to estimate the appropriate use of blood and blood components.

Aims

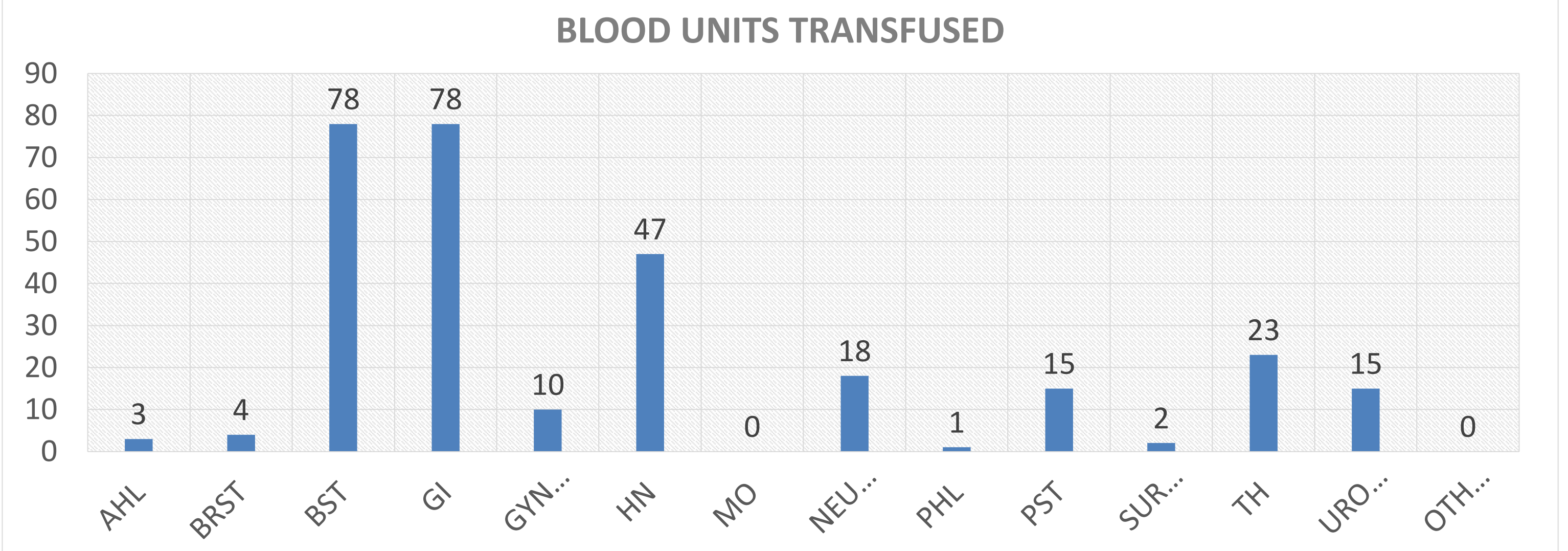
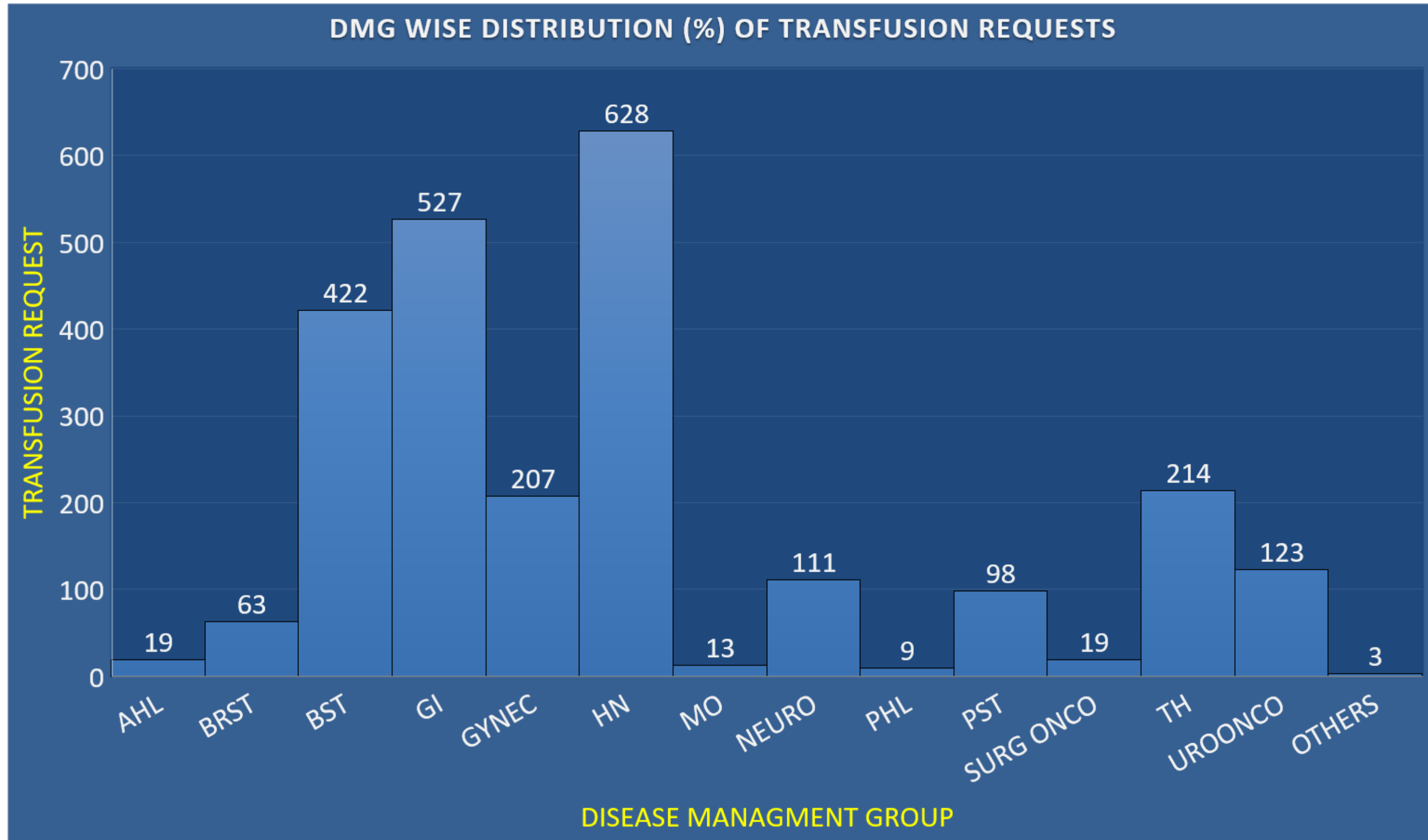
- To analyze the CT ratio, TI and TP.
- To assess the efficacy of blood ordering practices.

Methods and Materials

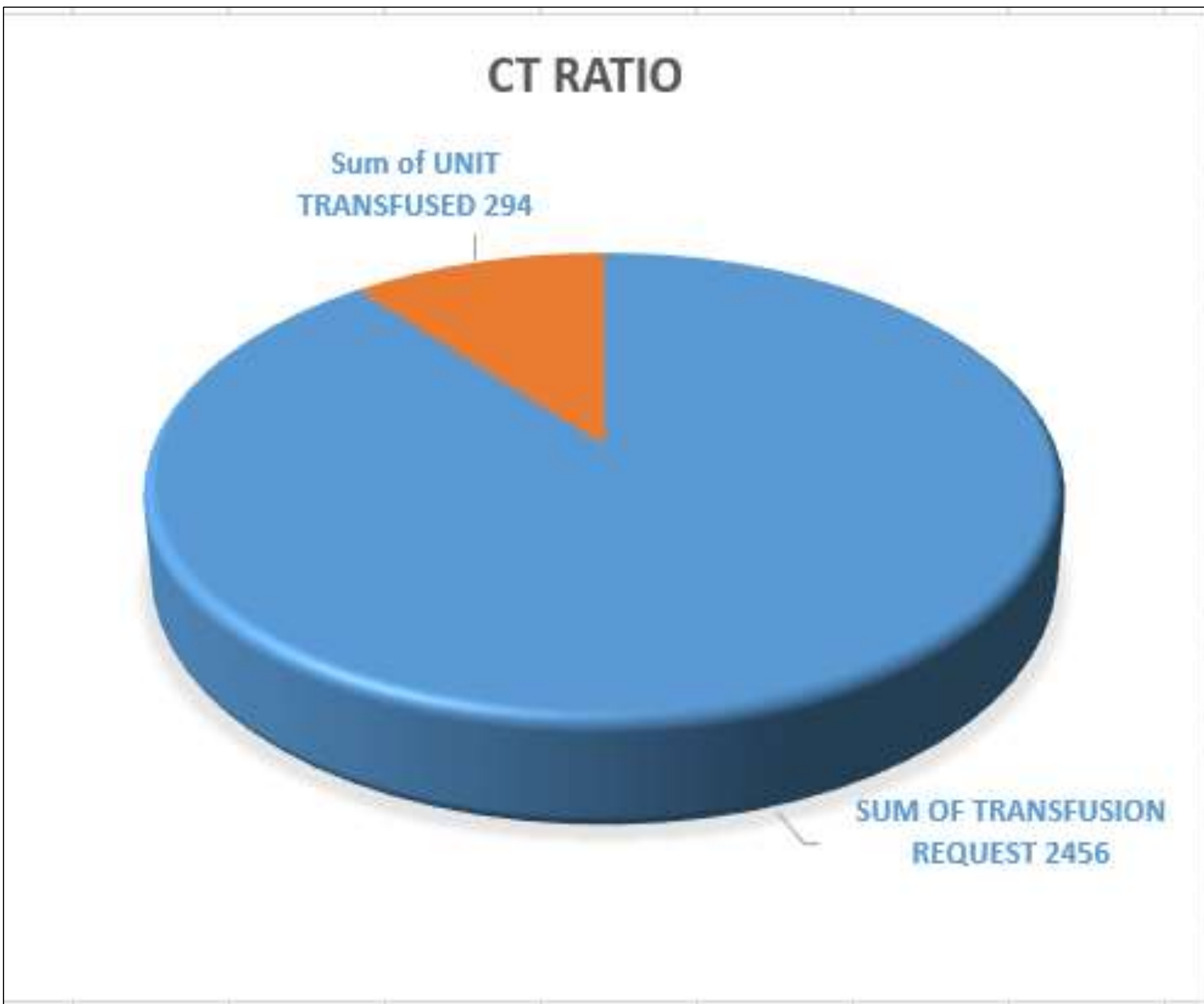
- **Study design:** Retrospective study
- **Duration:** Two months (August- September 2024).
- **Sample size:** 849 patients
- **Data collection:** Data was retrieved from the hospital information system and departmental records for the patients undergoing elective surgeries.
- **Data Analysis:** Data was analyzed for packed red blood cells (PRBC) crossmatched and transfused for 849 patients.
- Formulae use:
 - **C:T (Crossmatched: Transfusion) ratio** = No. of PRBC crossmatched/ No. of PRBC transfused.
 - **TI (Transfusion Index)** = No. of PRBC transfused/ No. of PRBC crossmatched.
 - **%T (Transfusion probability)** = No. of PRBC transfused/ No. of PRBC crossmatched x100.
- Various Disease Management Groups (DMG) evaluated were Ahl- adult hematology, GYNEC- Gynec oncology, PHL- Paediatric hematology, URO ONCO- Uro oncology, BRST- Breast Unit, HN- Head and neck unit, PST- Paediatric solid tumour, BST- Bone and soft tissue, MO- Medical oncology, SURG ONCO- Surgical oncology, GI- Gastrointestinal unit, NEURO- Neuro oncology, TH- Thoracic unit, OTHERS- Unit not mentioned

Table 1: DMG wise request and issue of PRBCs

DISEASE MANAGEMENT GROUP	Transfusion Request	PRBC transfused	CT RATIO	TI	% T
AHL	19	3	6.33	0.16	15.79
BRST	63	4	15.75	0.06	6.35
BST	422	78	5.41	0.18	18.48
GI	527	78	6.76	0.15	14.80
GYNEC	207	10	20.70	0.05	4.83
HN	628	47	13.36	0.07	7.48
MO	13	0	-	0.00	0.00
NEURO	111	18	6.17	0.16	16.22
PHL	9	1	9.00	0.11	11.11
PST	98	15	6.53	0.15	15.31
SURG ONCO	19	2	9.50	0.11	10.53
TH	214	23	9.30	0.11	10.75
UROONCO	123	15	8.20	0.12	12.20
OTHERS	3	0	-	0.00	0.00
Grand Total	2456	294	8.35	0.12	11.97



Results



DMG WITH MAXIMUM CT RATIO, TP AND TI

DMG	CT RATIO	TP	TI
GYNEC	20.70	4.83	0.05
BREAST	15.75	6.35	0.06
HN	13.36	7.48	0.07

Discussion

- Out of 2456 units of PRBC ordered and crossmatched, only 294 PRBC were transfused; the CT ratio was 8.3. Out of 849 patients, only 154 patients required PRBC transfusion giving TP of 11.97 and TI of 0.12.
- Major departments requesting PRBC were 25% from Head and neck (HN), 21% from Gastrointestinal (GI), 17% from bone and soft tissue (BST).
- Maximum blood utilization was observed from BST and GI unit.
- The CT ratio ranged from 6-20 with neuro-oncology having least (6) and Gynec-oncology having the maximum (20).
- There was 6 patients for whom crossmatch done for elective surgery and not received transfusion. The reason for that was patient was deceased.
- There was 39 patients whose surgery got postponed and 2 patients surgery planned in our other center ACTREC.

Conclusions

- The overall CT ratio is high with lower TP and TI of PRBC.
- A regular audit of transfusion services helps to improve transfusion practices.
- A patient specific blood ordering guidelines need to be made to avoid unnecessary cross matches and for better management of blood inventory.
- Developing the blood ordering policy can reduce extra ordering of blood, unnecessary compatibility testing, wastage of resources.

References:

- Joon V, Robins RDL, Haran A H, I SK, James S. Evaluating the Crossmatch-to-Transfusion Ratio as a Tool for Analyzing and Optimizing Blood Bank Resource Utilization: A Retrospective Observational Study. Cureus. 2024 Sep 21;16(9):e69862.
- Kaur A, Patale D, Lokhande T. Analyzing RBC Transfusion Practices Using Quality Indicators: A Retrospective Transfusion Audit. Cureus. 2024 Sep 16;16(9):e69550.