Medical Resource Utilizations and Economic Burden of Chemotherapy-Induced Anemia in Chinese Population: A Multi-center Retrospective Study

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INTRODUCTION

- Chemotherapy-induced anemia (CIA) is a common complication among cancer patients receiving chemotherapy treatment. CIA not only worsens patients' quality of life and treatment tolerance but also increases healthcare utilization and costs.

OBJECTIVE

- To compare real-world disease burden-medical resource use and direct medical costs-between cancer patients with CIA and those with non-CIA in China, using tertiary hospitals data.

METHOD

- **Data source**
  - A multi-center database based on three tertiary hospitals in Beijing, Wuhan and Nanning, China was used.
- **Study population** (Figure 1)
  - Population: Adults with lymphoma, breast, lung, colorectal, gastric, ovarian, cervical, or endometrial cancer (Jan 1, 2020-Jun 30, 2022) .
  - Grouping: CIA: Hb<120 g/L (men), <110 g/L (women) .
  - Follow-up: one year from chemotherapy initiation (Jul 1, 2020-Jun 30, 2022).
- **Statistical analysis**
  - Visits: Calculated outpatient (including emergency) and inpatient visit rates.
  - Cost categories: medication, examination, treatment, surgery, bed, materials, and others.
  - Cost estimation: total and per patient per month (PPPM) direct costs.

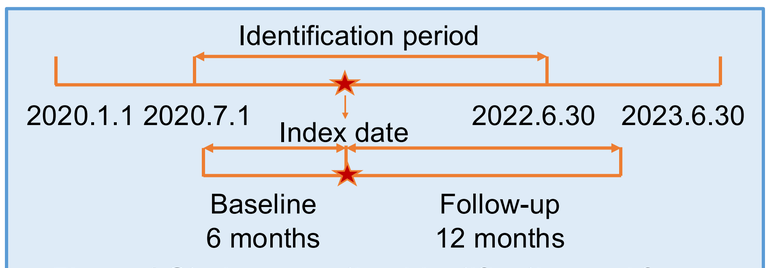


Figure 1 Study population identification and follow-up period

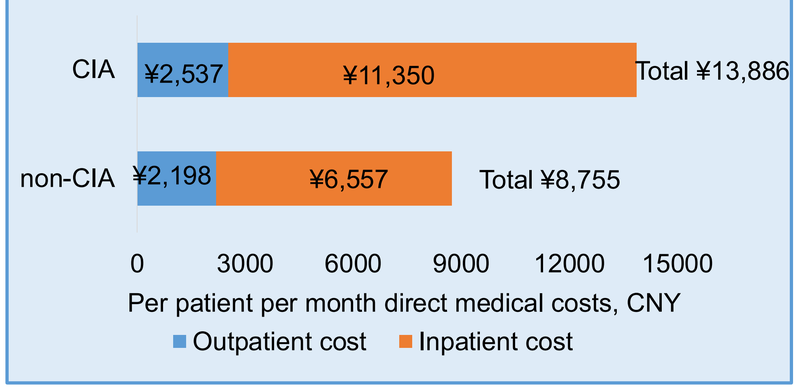
RESULT

- **Basic characteristics**
  - Among 2,431 patients (1,462 CIA, 969 non-CIA), CIA and non-CIA patients were generally older (57.2 ± 11.3 vs. 55.3 ± 11.3 years).
  - 97.5% of CIA group had mild anemia (90g/L≤Hb<normal), and 2.6% had moderate anemia (60g/L≤Hb<90g/L).
  - Breast cancer has the largest number of patients (34.0% vs. 37.9%), followed by lung cancer (19.1% vs. 16.5%) and colorectal cancer (13.3% vs. 20.1%) (Table 1).

Table 1 Basic characteristics

Variables	CIA patients (N=1,462)	Non-CIA patients (N=969)
Females, n (%)	1,007 (68.8)	703 (72.6)
Age, years, mean (SD)	57.2 (11.3)	55.3 (11.3)
Cancer, n (%)		
Breast cancer	497 (34.0)	367 (37.9)
Lung cancer	279 (19.1)	288 (19.4)
Colorectal cancer	194 (13.3)	195 (20.1)
Cervical cancer	144 (9.8)	69 (7.1)
Gastric cancer	140 (9.6)	27 (2.8)
Ovarian cancer	106 (7.3)	69 (7.1)
Lymphoma	55 (3.8)	17 (1.8)
Endometrial cancer	47 (3.2)	65 (6.7)
Hb level, g/L, mean (SD)		
Before chemotherapy		
Male	134.1 (9.4)	142.5 (10.6)
Female	122.7 (8.6)	128.5 (9.2)
After chemotherapy		
Male	113.4 (5.9)	/
Female	103.7 (5.8)	/

Figure 2 Per patient per month direct medical costs

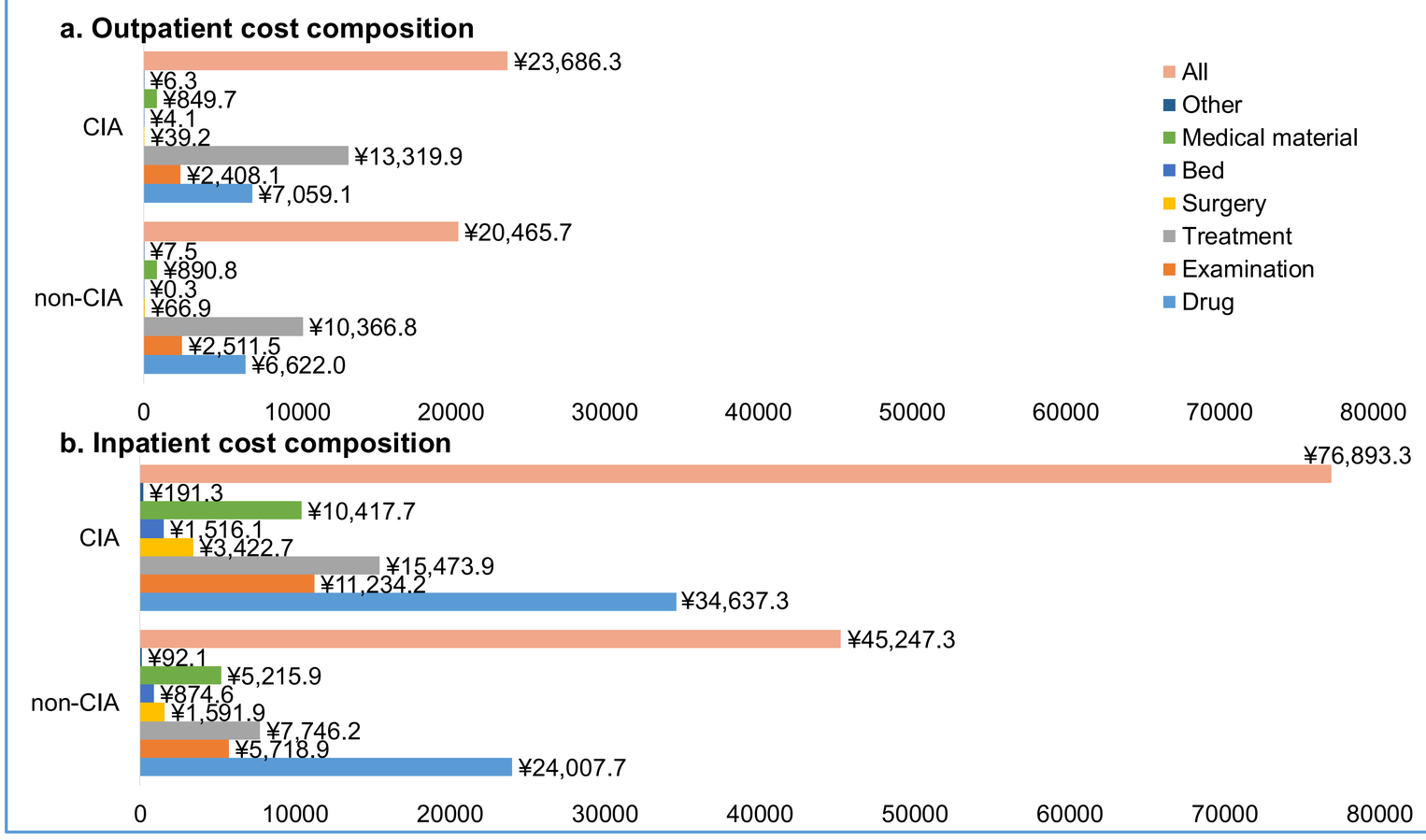


- **Economic burden**
  - Mean total direct medical costs per CIA patient was ¥100,580 ± 61,296. Non-CIA patients had mean costs of ¥65,713.0 ± 49,682.7, with 68.9% inpatient costs. PPPM costs were ¥13,886 (81.7% inpatient) for CIA and ¥8,755 (75.0% inpatient) for non-CIA (Figure 2, Figure 3).
- **Medical resource utilization**
  - Among patients with CIA, 99.8% had at least one hospitalization and 92.1% had outpatient visits, compared with 96.2% and 95.0%, respectively, among non-CIA patients.

Table 2 Medical resource utilization

Variables	CIA patients (N=1,462)	Non-CIA patients (N=969)
Outpatient		
Proportion of patients, n (%)	1,346 (92.1)	920 (94.9)
Mean number of visits, mean (SD)	14.0 (13.4)	12.1 (10.6)
Inpatient		
Proportion of patients, n (%)	1,459 (99.8)	932 (96.2)
Mean number of visits, mean (SD)	6.3 (3.2)	4.6 (2.7)

Figure 3 Direct medical cost composition



CONCLUSION

- CIA among Chinese cancer patients is associated with greater inpatient resource use and higher costs, highlighting the need to optimize anemia management and policies to reduce hospitalization burden.