Treatment Patterns for Chemotherapy-Induced Anemia in Chinese Population: A Multi-center Retrospective Study

RWD62

Boyang Li, Ke Zhang, Xiaoning He, Jing Wu

1. School of Pharmaceutical Science and Technology, Faculty of Medicine, Tianjin University, Tianjin, China

OBJECTIVE

- Chemotherapy-induced anemia (CIA) is a common adverse effect in cancer patients receiving chemotherapy that significantly affects treatment outcomes and quality of life. This study investigates the treatment patterns of CIA in the Chinese population using real-world data from tertiary hospitals.

METHODS

- **Data source**
  - A multi-center database based on three tertiary hospitals in Beijing, Wuhan and Nanning, China was used.
- **Study population**
  - Patients diagnosed with lymphoma, breast, lung, colorectal, gastric, ovarian, cervical, or endometrial cancer between January 1, 2020 and June 30, 2022 who developed CIA (hemoglobin (Hb)<120g/L for men, Hb<110g/L for women) were identified. Patients were followed for one year from initial chemotherapy between July 1, 2020 and June 30, 2022 (Figure 1).

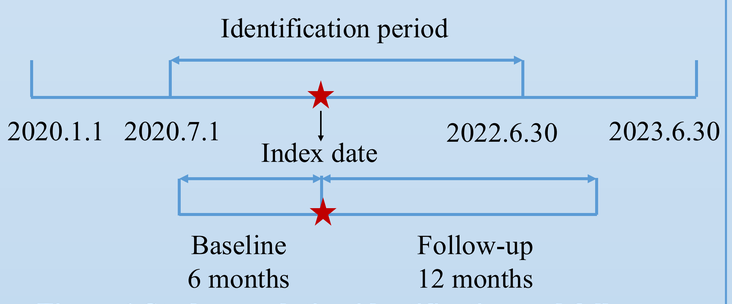


Figure 1 Study population identification and follow-up period

- **Statistical analysis**
  - We assessed the proportions of patients receiving red blood cell (RBC) transfusion, erythropoiesis-stimulating agents (ESAs), iron products, Chinese patent medicine (CPM), or untreated, and compared treatment patterns and costs by anemia severity using descriptive statistical analysis.

RESULTS

- **Basic characteristics**
  - Among 1,523 patients (mean age 57.4±11.3 years, 68.4% female), 97.4% had mild anemia (90g/L≤Hb<normal), and 2.6% had moderate anemia (60g/L≤Hb<90g/L).
  - Hemoglobin levels in CIA patients changed significantly before and after chemotherapy. Mean Hb in male patients decreased from 134.0 ± 9.4 g/L pre-chemotherapy to 113.1 ± 6.2 g/L post-chemotherapy. In female patients it decreased from 122.6 ± 8.6 g/L to 103.6 ± 6.0 g/L.
  - Breast cancer has the largest number of patients (32.8%), followed by lung cancer (19.0%) and colorectal cancer (13.6%) (Table 1).
  - The mean time from chemotherapy initiation to first onset of anemia among CIA patients was 45.0±39.6 days. Moderate anemia patients had a shorter mean time to onset of 24.5±27.0 days.
  - The average time interval between first anemia onset and first intervention was 45 days. 42.6% received anti-anemia treatment after chemotherapy initiation but before anemia developed, which may indicate a preventive approach against anemia.

Table 1 Basic characteristics of CIA patients

Variables	All patients (N=1523)	Mild patients (N=1483)	Moderate patients (N=40)
Females, n (%)	1,041 (68.4)	1,003 (67.6)	38 (95.0)
Age, years, mean (SD)	57.4 (11.4)	57.5 (11.4)	53.5 (9.3)
Cancer, n (%)			
Breast cancer	500 (32.8)	495 (33.4)	5 (12.5)
Lung cancer	290 (19.0)	288 (19.4)	2 (5.0)
Colorectal cancer	207 (13.6)	207 (14.0)	0 (0)
Cervical cancer	149 (9.8)	136 (9.2)	13 (32.5)
Gastric cancer	150 (9.9)	145 (9.8)	5 (12.5)
Ovarian cancer	121 (7.9)	108 (7.3)	13 (32.5)
Lymphoma	59 (3.9)	58 (3.9)	1 (2.5)
Endometrial cancer	47 (3.1）	46 (3.1）	1 (2.5）
Hb level, g/L, mean (SD)			
Before chemotherapy			
Male	134.0 (9.4)	133.9 (9.3)	149.2 (28.1)
Female	122.6 (8.6)	122.6 (8.6)	123.0 (9.1)
After chemotherapy			
Male	113.1 (6.2)	113.2 (5.9)	81.5 (6.4)
Female	103.6 (6.0)	104.4 (4.3)	82.6 (6.1)
Time from chemotherapy initiation to anemia onset, days, mean (SD)	45.0 (39.6)	45.6 (39.7)	24.5 (27.0)
Interval between anemia onset and initiation of anti-anemia treatment, days, mean (SD)	8.2 (73.8)	8.7 (75.3)	-2.3 (15.2)

Figure 2 Proportions of CIA patients with ESAs use, RBC transfusions, use of iron products, CPM use, and no treatment among follow-up period

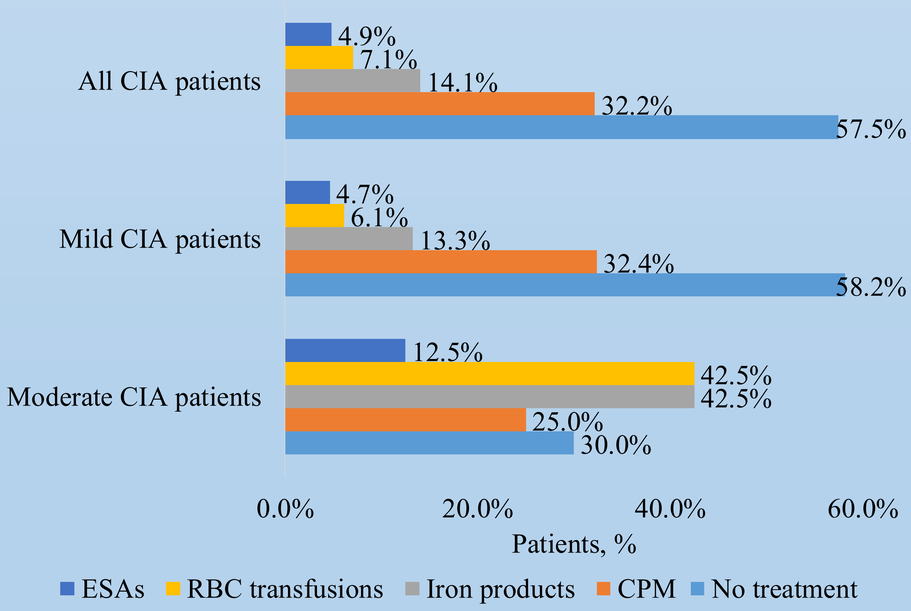
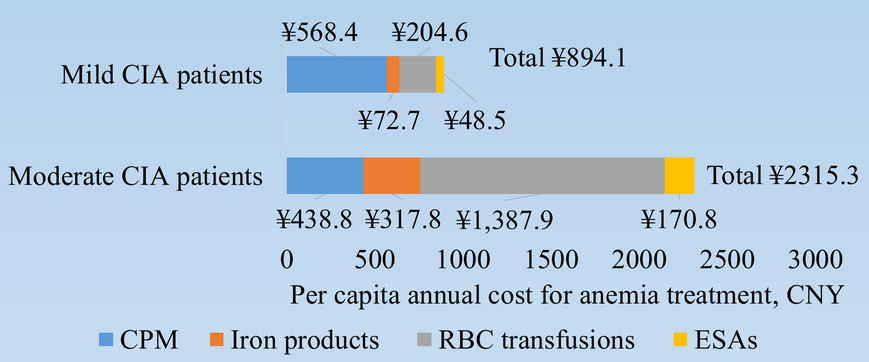


Figure 3 Per capita annual cost for anemia treatment



- **Treatment patterns**
  - A total of 57.5% CIA patients did not receive anemia treatment. CPM was the most common treatment (32.2%), followed by iron products (14.1%), RBC transfusions (7.1%), and ESAs (4.9%) (Figure 2).
  - Mild anemia patients had higher rates of no treatment (58.2% vs. 30.0%) and CPM use (32.37% vs. 25.0%) than moderate cases, while RBC transfusions (6.1% vs. 42.5%), ESAs (4.7% vs. 12.5%), and iron products (13.3% vs. 42.5%) was higher in moderate CIA patients (Figure 2).
  - Among patients receiving iron products (N=214), iron sucrose injection was the most frequently used agent (50%) (Table 2).

Table 2 Proportion of patients receiving iron products

Variables	All patients (N=1523)
Iron products (N=214), n (%),	
Iron sucrose injection	107 (50.0)
Iron polysaccharide complex capsules	71 (33.2)
Ferrous succinate tablets	64 (30.0)
Iron proteinsuccinylate oral solution	16 (7.5)
Iron dextran injection	4 (1.9)

  - Among the 490 patients who received CPM, 67.1% took Shengxue pills, 23.1% took Yangxueyin oral liquid, and 16.73% used Diyu Shengbai tablets (Table 3).

Table 3 Proportion of patients receiving CPM

Variables	All patients (N=1523)
CPM (N=490), n (%),	
Shengxue pills	329 (67.1)
Yangxueyin oral liquid	113 (23.1)
Diyu Shengbai tablets	82 (16.7)
Shengxuening tablets	18 (3.7)
Shengxuebao oral mixture	13 (2.7)
Danggui Buxue pills	12 (2.5)
Qijiao Shengbai capsules	9 (1.8)
Yixuesheng capsules	8 (1.6)
Weixuening Granules	4 (0.8)
Guiqi Buxue oral liquid	3 (0.6)

  - Per capita annual cost for anemia treatment was CNY 894.1 in mild and CNY 2315.3 in moderate, mainly from with CPM (63.6%, CNY 568.4) and RBC transfusions (60.0%, CNY 1387.9), respectively (Figure 3).

CONCLUSION

- A large proportion of CIA patients in China remain untreated, indicating a significant management gap. Treatment patterns varied by anemia severity. CPM is the most frequently used and costliest therapy.