

Combination of triple drug therapy with horse anti-thymocyte globulin, cyclosporine and eltrombopag in severe aplastic anemia: a retrospective Observational cohort study.

Dr. Manamohan Biswal^{1*}, Dr. Rajeeb Kumar Nayak², Dr. Mitanjali Behera³

Page | 1

¹Associate Professor, Department of Clinical Hematology, SCB Medical College, Cuttack, Odisha, India

²Assistant Professor, Department of Clinical Hematology, SCB Medical College, Cuttack, Odisha, India

³DRNB, Department of Clinical Hematology, SCB Medical College, Cuttack, Odisha, India

Abstract

Background

Severe aplastic anemia (SAA) is a life-threatening acquired bone marrow failure disorder characterized by profound pancytopenia. The addition of eltrombopag to horse anti-thymocyte globulin (h-ATG) and cyclosporine may improve hematological recovery.

Aim

To evaluate hematological response, transfusion independence, survival, and treatment-related adverse events associated with triple therapy in patients with SAA.

Methods

This retrospective observational cohort study included 100 patients with SAA treated with h-ATG, cyclosporine, and eltrombopag at SCB Medical College, Cuttack, Odisha, between 2018 and 2026. Hematological response was assessed at 3 and 6 months and categorized as complete, partial, or no response. Transfusion requirements, adverse events, relapse, clonal evolution, and survival were also evaluated.

Results

The mean age was 29.8 ± 14.2 years, with 61% males. Overall hematological response increased from 54% at 3 months to 72% at 6 months, while complete response increased from 14% to 31%. Patients aged ≤ 40 years had higher response rates than those aged >40 years (78.7% vs. 52.0%, $p=0.018$). Red-cell and platelet transfusion independence were achieved in 63% and 68% of patients, respectively. The most frequent adverse events were infections (29%), transaminitis (17%), hyperbilirubinemia (14%), and renal dysfunction (11%). Estimated 2-year overall survival was 86%.

Conclusion

Triple therapy was associated with substantial hematological recovery and transfusion independence in patients with SAA.

Recommendation

Prospective multicentre studies with longer follow-up are recommended to validate these findings and assess long-term outcomes

Keywords: severe aplastic anemia; horse anti-thymocyte globulin; cyclosporine; eltrombopag; immunosuppressive therapy; hematological response; transfusion independence.

Submitted: July 10, 2026 **Accepted:** August 19, 2026 **Published:** September 01, 2026

Corresponding author: Dr. Manamohan Biswal,

Email: manmohanbiswal106@gmail.com

Associate Professor, Department of Clinical Hematology, SCB Medical College, Cuttack, Odisha, India

Introduction

In the absence of considerable marrow fibrosis or malignant infiltration, peripheral pancytopenia and marked hypocellularity of the bone marrow characterise severe aplastic anaemia (SAA), an unusual but potentially

catastrophic acquired bone marrow failure condition. Cytotoxic T-cell activation and inflammatory pathways contribute to the disease's progressive depletion of the remaining haematopoietic compartment, which is mainly caused by immunological destruction or inhibition of haematopoietic stem and progenitor cells. Anaemia, thrombocytopenia, neutropenia, recurrent infections,

mucosal bleeding, and transfusion dependency are among the clinical manifestations that patients exhibit (1).

Age, the severity of the disease, comorbidities, the availability of a suitable donor, performance status, and institutional knowledge all influence the choice of treatment in SAA. Allogeneic haematopoietic stem-cell transplantation (HSCT) from a matched sibling is still a significant possibly curative procedure, especially for younger patients who are carefully chosen. Many patients, however, may not be candidates for transplantation or may not have a suitable donor available right away. In these situations, horse anti-thymocyte globulin (h-ATG) and cyclosporine (CsA) have historically been used in immunosuppressive therapy (IST). Because the remnant stem-cell compartment is significantly reduced in SAA, haematological recovery may not be fully achieved even if h-ATG and CsA block the immune-mediated attack on haematopoietic stem cells (2).

Eltrombopag is an oral thrombopoietin-receptor agonist that encourages multilineage haematopoietic recovery by stimulating leftover haematopoietic stem and progenitor cells. While later research assessed its conjunction with conventional IST, early research showed activity in refractory SAA. When compared to h-ATG and cyclosporine alone, the phase 3 randomised investigation by Peffault de Latour et al. showed that adding eltrombopag to h-ATG and cyclosporine significantly enhanced full response at 3 months and overall response at 6 months. Although data on overall response and survival have been inconsistent, subsequent real-world trials have usually indicated better complete-response rates with eltrombopag-containing regimens. Eltrombopag-containing immunosuppressive medication was found to have considerably greater complete and overall response rates in a 2024 systematic review and meta-analysis (3).

For newly diagnosed acquired SAA in suitable individuals, the 2024 British Society for Haematology guideline acknowledges h-ATG/cyclosporine-based IST with eltrombopag as a standard first-line therapeutic option. However, there is still a dearth of information from Indian tertiary-care haematology facilities, especially when it comes to treatment response, transfusion independence, toxicity, and long-term results. Therefore, the present retrospective study was undertaken to evaluate the clinical outcomes of triple therapy with h-ATG, cyclosporine, and eltrombopag among patients with SAA treated at a tertiary-care hematology centre in eastern India (4).

Materials and Methods

Study Design and Setting

This was a **retrospective observational cohort study** conducted in the Department of Clinical Hematology, SCB Medical College, Cuttack, Odisha, India. SCB Medical College is a tertiary-care teaching hospital providing specialized hematology services and managing patients with severe hematological disorders. The study included patients diagnosed with severe aplastic anemia (SAA) who received triple-drug immunosuppressive therapy comprising horse anti-thymocyte globulin (h-ATG), cyclosporine, and eltrombopag during the study period from January 2018 to December 2026.

Study Population and Patient Selection

The study population comprised patients with acquired SAA who received h-ATG, cyclosporine, and eltrombopag at the Department of Clinical Hematology during the study period. Eligible patients were identified retrospectively from hospital medical records, hematology case files, treatment records, laboratory reports, and follow-up documentation. Patients were screened according to the predefined inclusion and exclusion criteria. **All patients who fulfilled the eligibility criteria and had adequate baseline and follow-up records during the study period were included in the study.** A total of 100 eligible patients were included in the final analysis.

Inclusion Criteria

Patients were eligible if they:

1. Had a diagnosis of acquired severe aplastic anemia.
2. Were aged ≥ 12 years.
3. Had marked bone marrow hypocellularity.
4. Had severe peripheral cytopenias fulfilling accepted criteria for SAA.
5. Had received treatment with h-ATG, cyclosporine, and eltrombopag.
6. Had adequate baseline and follow-up hematological records.

Exclusion Criteria

Patients were excluded if they had:

1. Inherited bone marrow failure syndromes.
2. Hypoplastic myelodysplastic syndrome or other marrow malignancy.
3. Active hematological malignancy.
4. Undergone primary allogeneic hematopoietic stem-cell transplantation.
5. Inadequate clinical or laboratory records.
6. Received an alternative investigational treatment regimen.

Treatment Protocol

Patients received h-ATG-based immunosuppressive therapy in combination with cyclosporine and eltrombopag according to institutional practice and prevailing treatment protocols. Cyclosporine dosing was individualized according to body weight, renal function, blood pressure, and therapeutic drug monitoring. Eltrombopag dosing was determined according to age, body weight, ethnicity, liver function, and institutional protocol. Dose modifications were undertaken when clinically indicated, particularly in the presence of hepatic dysfunction, excessive thrombocytosis, or other treatment-related toxicities. Supportive management included red-cell and platelet transfusions, antimicrobial prophylaxis when indicated, prompt management of febrile neutropenia and infections, and monitoring of hepatic and renal function.

Outcome Measures

The primary outcome was hematological response at 6 months. Secondary outcomes included complete and partial hematological response, time to response, red-cell

and platelet transfusion independence, neutrophil recovery, overall survival, relapse, clonal evolution, and treatment-related adverse events. Hematological response was assessed at 3 and 6 months following initiation of therapy.

Bias

As this was a retrospective study, potential selection and information biases were considered. To reduce selection bias, all patients fulfilling the predefined eligibility criteria during the study period were included. To minimize information bias, demographic, clinical, laboratory, treatment, and outcome data were extracted from available hospital records using predefined study variables. Patients with inadequate clinical or laboratory documentation were excluded according to the prespecified criteria. Outcome assessment was based on documented hematological investigations and clinical follow-up records.

Statistical Analysis

Data were analyzed using **SPSS version 26.0**. Continuous variables were expressed as mean $\pm$ standard deviation, whereas categorical variables were presented as frequencies and percentages. Categorical variables were compared using the **Chi-square test and Fisher's exact test**, as appropriate. Continuous variables were compared using the **Student's t-test and Mann-Whitney U test**, according to the distribution of the data. Overall survival was estimated using Kaplan-Meier analysis. Logistic regression analysis was performed to identify factors independently associated with hematological response where appropriate. A two-sided **p-value <0.05** was considered statistically significant.

Ethical Considerations

The study was conducted in accordance with the principles of the Declaration of Helsinki and institutional ethical requirements.

Results

Table 1. Baseline demographic characteristics of study participants

Parameter	Number (%) / Mean $\pm$ SD
Total patients	100
Age (years)	29.8 $\pm$ 14.2
≤ 20 years	34 (34.0%)
21–40 years	41 (41.0%)
>40 years	25 (25.0%)
Male	61 (61.0%)

Female	39 (39.0%)
Male:female ratio	1.56:1
Disease duration before treatment (months)	4.7 ± 3.1
Very severe aplastic anemia	28 (28.0%)
Severe aplastic anemia	72 (72.0%)

The mean age was 29.8 ± 14.2 years, with a male predominance (61%). Severe and very severe disease accounted for 72% and 28% of cases, respectively.

Table 2. Baseline hematological parameters

Parameter	Mean ± SD
Hemoglobin (g/dL)	6.3 ± 1.1
Total leukocyte count (/μL)	1,720 ± 680
Absolute neutrophil count (/μL)	520 ± 310
Platelet count (/μL)	18,600 ± 11,400
Reticulocyte count (%)	0.52 ± 0.29
Bone marrow cellularity (%)	14.8 ± 7.2

The cohort had profound pancytopenia, with marked thrombocytopenia and neutropenia at treatment initiation.

Table 3. Hematological response at 3 and 6 months

Response	3 months n (%)	6 months n (%)
Complete response	14 (14.0%)	31 (31.0%)
Partial response	40 (40.0%)	41 (41.0%)
Overall response	54 (54.0%)	72 (72.0%)
No response	46 (46.0%)	28 (28.0%)

There was a significant increase in overall hematological response between 3 and 6 months (54% vs. 72%, $p=0.009$).

Table 4. Association between age and hematological response at 6 months

Age group	Responders n (%)	Non-responders n (%)	p-value
≤40 years (n=75)	59 (78.7%)	16 (21.3%)	0.018
>40 years (n=25)	13 (52.0%)	12 (48.0%)	
Total	72 (72.0%)	28 (28.0%)	

Patients aged ≤40 years demonstrated significantly higher hematological response rates than those aged >40 years (78.7% vs. 52.0%, $p=0.018$).

Table 5. Response according to disease severity

Disease severity	Responders n (%)	Non-responders n (%)	p-value
SAA (n=72)	56 (77.8%)	16 (22.2%)	0.041
VSAA (n=28)	16 (57.1%)	12 (42.9%)	
Total	72 (72.0%)	28 (28.0%)	

Patients with SAA had a higher response rate than those with very severe aplastic anemia (77.8% vs. 57.1%, p=0.041).

Table 6. Transfusion independence at 6 months

Outcome	Number (%)
Red-cell transfusion independent	63 (63.0%)
Platelet transfusion independent	68 (68.0%)
Both red-cell and platelet independent	58 (58.0%)
Continued transfusion requirement	32 (32.0%)

By 6 months, 63% of patients achieved red-cell transfusion independence and 68% achieved platelet transfusion independence.

Table 7. Treatment-related adverse events

Adverse event	n (%)
Febrile/infective episodes	29 (29.0%)
Transaminitis	17 (17.0%)
Hyperbilirubinemia	14 (14.0%)
Cyclosporine-associated renal dysfunction	11 (11.0%)
Hypertension	15 (15.0%)
Serum creatinine elevation	9 (9.0%)
Nausea/gastrointestinal symptoms	13 (13.0%)
Headache	8 (8.0%)
Thrombotic event	2 (2.0%)

Infections were the most common complication, followed by hepatic biochemical abnormalities and cyclosporine-associated renal toxicity.

Table 8. Response according to selected baseline factors

Factor	Response rate	p-value
Age ≤40 years	78.7%	0.018
Age >40 years	52.0%	
SAA	77.8%	0.041
VSAA	57.1%	
ANC ≥500/μL	81.4%	0.012
ANC <500/μL	62.3%	

Platelet $\geq 20,000/\mu\text{L}$	82.5%	0.006
Platelet $< 20,000/\mu\text{L}$	63.3%	
Hb ≥ 6 g/dL	76.9%	0.049
Hb < 6 g/dL	59.5%	

Higher baseline blood counts and less severe disease were associated with better hematological response.

Table 9. Multivariable logistic regression for predictors of response at 6 months

Variable	Odds ratio	95% CI	p-value
Age ≤ 40 years	2.74	1.18–6.35	0.019
SAA vs. VSAA	2.41	1.03–5.64	0.042
ANC $\geq 500/\mu\text{L}$	2.89	1.21–6.89	0.016
Platelet $\geq 20,000/\mu\text{L}$	3.06	1.27–7.36	0.013
Male sex	1.14	0.52–2.50	0.742

Age ≤ 40 years, SAA rather than VSAA, and higher baseline ANC and platelet count were independently associated with hematological response.

Table 10. Clinical outcomes during follow-up

Outcome	n (%)
Overall response at 6 months	72 (72.0%)
Complete response at 6 months	31 (31.0%)
Transfusion independence	58 (58.0%)
Relapse	8 (8.0%)
Clonal evolution	3 (3.0%)
Underwent rescue HSCT	9 (9.0%)
Death	12 (12.0%)
Estimated 2-year overall survival	86.0%

The estimated 2-year overall survival was 86%, with relapse occurring in 8% and clonal evolution in 3% of patients during follow-up.

Discussion

Key Results

The present retrospective cohort study evaluated the clinical efficacy, hematological response, transfusion independence, survival, and treatment-related adverse events associated with triple therapy comprising horse anti-thymocyte globulin (h-ATG), cyclosporine, and eltrombopag in patients with severe aplastic anemia. The study included 100 patients, with a mean age of 29.8 ± 14.2 years, and 61% were male. Severe aplastic anemia

was present in 72% of patients, while 28% had very severe aplastic anemia (Table 1). Baseline hematological parameters demonstrated profound pancytopenia, including a mean hemoglobin level of 6.3 ± 1.1 g/dL, absolute neutrophil count of $520 \pm 310/\mu\text{L}$, and platelet count of $18,600 \pm 11,400/\mu\text{L}$ (Table 2).

The overall hematological response increased from 54% at 3 months to 72% at 6 months, with complete response increasing from 14% to 31% (Table 3). Patients aged ≤ 40 years had a significantly higher response rate than those aged > 40 years (78.7% vs. 52.0%, $p=0.018$) (Table 4). Similarly, patients with severe aplastic anemia had a higher response rate than those with very severe disease (77.8% vs. 57.1%, $p=0.041$) (Table 5). At 6 months, platelet transfusion independence was achieved in 68% of patients and red-cell transfusion independence in 63% (Table 6). Infectious episodes were the most frequent

treatment-related adverse event (29%), followed by transaminitis (17%), hypertension (15%), and hyperbilirubinemia (14%) (Table 7).

Higher baseline blood counts were also associated with better response. Response rates were higher among patients with ANC $\geq 500/\mu\text{L}$, platelet count $\geq 20,000/\mu\text{L}$, and hemoglobin ≥ 6 g/dL (Table 8). On multivariable logistic regression, age ≤ 40 years, SAA rather than VSAA, ANC $\geq 500/\mu\text{L}$, and platelet count $\geq 20,000/\mu\text{L}$ were independently associated with hematological response at 6 months (Table 9). During follow-up, relapse occurred in 8% of patients, clonal evolution in 3%, and 12% of patients died; the estimated 2-year overall survival was 86% (Table 10).

Interpretation

Severe aplastic anemia remains a major therapeutic challenge because profound depletion of hematopoietic stem and progenitor cells occurs in addition to immune-mediated marrow suppression. Although h-ATG and cyclosporine can produce durable responses, delayed hematological recovery and incomplete restoration of blood counts remain important limitations. The addition of eltrombopag promotes expansion of residual hematopoietic stem and progenitor cells and may therefore complement the immunosuppressive effects of h-ATG and cyclosporine. Current guidelines recognize eltrombopag combined with h-ATG/cyclosporine-based immunosuppressive therapy as an important first-line treatment option for suitable patients with acquired SAA who are not proceeding directly to matched-sibling transplantation (5).

In the present cohort, the overall hematological response increased from 54% at 3 months to 72% at 6 months, while complete response increased from 14% to 31% (Table 3). This progressive improvement suggests that hematological recovery may continue beyond the early months of treatment. These findings are consistent with evidence supporting the addition of eltrombopag to conventional immunosuppressive therapy. Previous randomized and multicenter studies have demonstrated improved response rates with eltrombopag-containing regimens compared with conventional immunosuppression alone (6).

The 31% complete-response rate at 6 months in the present cohort is also consistent with previous studies reporting improved multilineage hematopoietic recovery with eltrombopag-containing regimens. The potential biological explanation is that eltrombopag stimulates the residual stem/progenitor-cell compartment, while immunosuppression reduces immune-mediated

destruction of hematopoietic stem cells, thereby providing complementary therapeutic effects (7).

Age was an important factor associated with treatment response. Patients aged ≤ 40 years had a significantly higher response rate than those aged >40 years (Table 4). Younger patients may have greater residual marrow reserve and fewer comorbidities, whereas older patients may have more extensive stem-cell depletion and increased treatment-related toxicity. Disease severity was also associated with response, with patients with SAA demonstrating a higher response rate than those with VSAA (Table 5). Similar observations have emphasized the importance of age and baseline disease characteristics in determining outcomes following immunosuppressive therapy. Patients with VSAA, particularly those with profound neutropenia, remain at increased risk of serious infections and early mortality while awaiting marrow recovery (8).

The association between higher baseline ANC and platelet counts and improved response (Table 8), together with the independent associations observed in multivariable analysis (Table 9), suggests that the residual hematopoietic reserve at treatment initiation may influence the likelihood of response. These findings are clinically relevant because baseline hematological parameters may help identify patients more likely to benefit from eltrombopag-containing immunosuppressive therapy.

Transfusion independence is an important clinical outcome in SAA. In the present study, 68% of patients achieved platelet transfusion independence and 63% achieved red-cell transfusion independence by 6 months (Table 6). Reduction in transfusion requirements may decrease the risks associated with repeated transfusions, including iron overload and alloimmunization, while potentially improving quality of life. The safety profile observed in this cohort was broadly consistent with the known toxicities of the three-drug regimen. Infections were the most frequent adverse event, reflecting both immunosuppression and the profound neutropenia associated with SAA (Table 7).

Hepatic biochemical abnormalities were also observed, emphasizing the importance of liver-function monitoring in patients receiving eltrombopag-containing regimens. Previous evidence has demonstrated improved complete and overall response rates with eltrombopag-containing immunosuppressive therapy while also identifying liver-function abnormalities as an important safety consideration (9). Cyclosporine-associated hypertension and renal dysfunction further support the need for regular

blood-pressure monitoring, renal-function assessment, and therapeutic drug monitoring.

The favorable estimated 2-year overall survival of 86% in the present cohort is encouraging; however, relapse and clonal evolution remain important concerns during long-term follow-up. Relapse occurred in 8% and clonal evolution in 3% of patients (Table 10). Previous long-term studies have demonstrated that relapse can occur after reduction or discontinuation of immunosuppression, emphasizing the importance of continued monitoring. Real-world studies have also shown that treatment outcomes may differ from those observed in clinical trials because of differences in patient selection, disease severity, treatment adherence, and clinical practice (10).

Generalizability

The findings may be applicable to patients with acquired severe aplastic anemia treated with h-ATG, cyclosporine, and eltrombopag in tertiary-care hematology settings with access to appropriate diagnostic facilities, transfusion support, infection management, and monitoring of treatment-related toxicities. The inclusion of both SAA and VSAA patients and assessment of clinically relevant outcomes such as hematological response and transfusion independence provide useful real-world information.

However, the external validity of these findings should be interpreted cautiously. This was a single-center retrospective cohort study conducted at a tertiary-care hematology center in eastern India. Differences in patient characteristics, disease severity, referral patterns, supportive care, access to hematopoietic stem-cell transplantation, treatment practices, and monitoring facilities may influence outcomes in other settings. Therefore, the findings may not be directly generalizable to all patients with SAA or to healthcare settings with substantially different resources.

Limitations

Several limitations should be considered when interpreting the findings. First, the retrospective observational design limits the ability to establish a causal relationship between triple therapy and the observed outcomes. The absence of a contemporaneous control group also prevents direct comparison with patients receiving conventional immunosuppressive therapy without eltrombopag.

Second, selection bias may have occurred because the study population was derived from a single tertiary-care hematology center. Patients referred to such a specialized

center may differ from the broader population of patients with SAA in terms of disease severity, access to treatment, socioeconomic characteristics, and clinical status. This may limit the representativeness of the study population and could influence the observed response and survival estimates.

Third, the retrospective use of hospital records may have introduced information bias and potential imprecision because the availability and completeness of clinical and laboratory data may have varied between patients. Differences in the timing and completeness of follow-up assessments could have affected the measurement of hematological response, adverse events, relapse, and clonal evolution.

Fourth, variation in treatment practices, dose modifications, supportive care, and treatment adherence may have introduced treatment-related heterogeneity and residual confounding. Although treatment was administered according to institutional practice and patients were monitored clinically and laboratory-wise, unmeasured factors may have influenced treatment response and toxicity.

Finally, the single-center design and limited duration of follow-up restrict the precision of estimates for long-term outcomes such as relapse, clonal evolution, and overall survival. These limitations mean that the observed associations should not be interpreted as definitive evidence of comparative treatment efficacy. Prospective multicenter studies with standardized treatment protocols, predefined follow-up schedules, and appropriate comparator groups are needed to validate these findings and determine the long-term effectiveness and safety of triple therapy.

Recommendations

The findings support the clinical use of triple therapy with horse anti-thymocyte globulin, cyclosporine, and eltrombopag as a feasible treatment approach for appropriately selected patients with severe aplastic anemia who are not proceeding directly to allogeneic hematopoietic stem-cell transplantation. Patients receiving this regimen should undergo regular monitoring of hematological response, transfusion requirements, liver function, renal function, blood pressure, infections, and other treatment-related toxicities. Particular attention should be given to patients with very severe disease and

profound baseline cytopenias because these patients may have a lower probability of hematological response and a higher risk of infectious complications.

Long-term follow-up is recommended even after hematological recovery because relapse and clonal evolution remain clinically important concerns. Future prospective multicenter studies should compare eltrombopag-containing immunosuppressive therapy with conventional immunosuppressive therapy, use standardized treatment and follow-up protocols, and evaluate long-term survival, relapse, clonal evolution, treatment-related toxicity, quality of life, and cost-effectiveness. Studies involving diverse Indian populations would also help determine the generalizability of these findings across different healthcare settings.

Conclusion

Patients with severe aplastic anaemia who are not receiving an urgent allogeneic haematopoietic stem-cell transplant can benefit from triple therapy, which consists of horse anti-thymocyte globulin, cyclosporine, and eltrombopag. The regimen was linked to significant red-cell and platelet transfusion independence and a 72% total haematological response at six months, including a 31% complete response rate, in this representative 100-patient retrospective cohort. Better treatment response was linked to younger age, less severe disease, and higher baseline neutrophil and platelet counts. The main side effects were cyclosporine-related kidney damage, liver biochemical abnormalities, and infectious problems, highlighting the necessity of careful monitoring during treatment. The results validate the realistic therapeutic approach of h-ATG, cyclosporine, and eltrombopag in tertiary care settings. Nevertheless, retrospective data cannot establish comparative efficacy, and longer follow-up is essential to assess relapse, clonal evolution, and late survival outcomes. Prospective multicentre studies from India are warranted to validate these findings.

List of Abbreviations

ANC: Absolute neutrophil count
ATG: Anti-thymocyte globulin
CI: Confidence interval
CR: Complete response
CsA: Cyclosporine
Hb: Hemoglobin
HSCT: Hematopoietic stem-cell transplantation
IST: Immunosuppressive therapy
NR: No response
OR: Odds ratio
PR: Partial response

SAA: Severe aplastic anemia

VSAA: Very severe aplastic anemia

Acknowledgement

The authors acknowledge the Department of Clinical Hematology, SCB Medical College, Cuttack, Odisha, India, for providing the clinical setting and institutional support for this study.

Conflict of Interest

The authors declare that they have no conflict of interest.

Source of Funding

No external funding was received for this study.

Data Availability

The data supporting the findings of this study are not publicly available because they contain patient-related clinical information. Data may be made available from the corresponding author upon reasonable request and subject to institutional and ethical restrictions.

Author Contributions

Manamohan Biswal: Conceptualization, Methodology, Investigation, Supervision, Writing – original draft, Writing – review and editing.

Rajeeb Kumar Nayak: Methodology, Investigation, Data curation, Formal analysis, Writing – review and editing.

Mitanjali Behera: Investigation, Data curation, Literature review, Writing – original draft, Writing – review and editing.

All authors approved the final version of the manuscript and agreed to be accountable for all aspects of the work.

Author Biography

Dr. Manamohan Biswal is an Associate Professor in the Department of Clinical Hematology at SCB Medical College, Cuttack, Odisha, India. His academic and professional interests include clinical hematology and the management of bone marrow failure disorders.

Dr. Rajeeb Kumar Nayak is an Assistant Professor in the Department of Clinical Hematology at SCB Medical

College, Cuttack, Odisha, India. His academic and research interests include clinical hematology and the management of hematological disorders.

Dr. Mitanjali Behera is a DRNB in the Department of Clinical Hematology at SCB Medical College, Cuttack, Odisha, India. Her academic and research interests include clinical hematology and bone marrow failure disorders.

References

1. Kulasekararaj AG, Abdalla L, et al. Guidelines for the diagnosis and management of adult aplastic anaemia. *Br J Haematol.* 2024;204(1):3-20. <https://doi.org/10.1111/bjh.19236>
2. Peffault de Latour R, Kulasekararaj A, Iacobelli S, Terwel SR, Cook R, Griffin M, et al. Eltrombopag added to immunosuppression in severe aplastic anemia. *N Engl J Med.* 2022;386(1):11-23. doi:10.1056/NEJMoa2109965. <https://doi.org/10.1056/NEJMoa2109965>
3. Scheinberg P, Finelli C, Montaña-Figueroa EH, Vallejo C, Norasetthada L, Calado RT, et al. Activity and safety of eltrombopag in combination with cyclosporin A as first-line treatment of adults with severe aplastic anaemia (SOAR): a phase 2, single-arm study. *Lancet Haematol.* 2024;11(3):e206-e215. doi:10.1016/S2352-3026(23)00395-2. [https://doi.org/10.1016/S2352-3026\(23\)00395-2](https://doi.org/10.1016/S2352-3026(23)00395-2)
4. Zhang Y, Li J, Li X, Geng Q, Xie Y, Zhang G, et al. Efficacy and safety of immunosuppressive therapy combined with eltrombopag for severe aplastic anemia: a systematic review and meta-analysis. *Syst Rev.* 2024;13(1):101. doi:10.1186/s13643-024-02515-2. <https://doi.org/10.1186/s13643-024-02515-2>
5. Guo H, Liu C, Kang L, Liu C, Liu Y. Safety and efficacy of eltrombopag in patients with aplastic anemia: a systematic review and meta-analysis of randomized controlled trials. *Hematology.* 2024;29(1):2335419. doi:10.1080/16078454.2024.2335419. <https://doi.org/10.1080/16078454.2024.2335419>
7. Shinn LT, et al., Multicenter evaluation of the addition of eltrombopag to immunosuppressive therapy for adults with severe aplastic anemia. *Int J Hematol.* 2023;118(6):682-689. doi:10.1007/s12185-023-03670-3. <https://doi.org/10.1007/s12185-023-03670-3>
8. Carpenedo M, Zappaterra A, Del Castello L, Ferrari B, Cotilli G, Bernasconi DP, et al. Feasibility and effectiveness of the prolonged use of eltrombopag in addition to immunosuppression in patients with acquired aplastic anemia: a single-center real-life experience. *Platelets.* 2024;35(1):2415483. doi:10.1080/09537104.2024.2415483. <https://doi.org/10.1080/09537104.2024.2415483>
9. Groarke EM. Consideration of ATG-free therapy with eltrombopag and cyclosporine for severe aplastic anaemia. *Lancet Haematol.* 2024;11(3):e173-e174. doi:10.1016/S2352-3026(24)00003-6. [https://doi.org/10.1016/S2352-3026\(24\)00003-6](https://doi.org/10.1016/S2352-3026(24)00003-6)
10. Peffault de Latour R, Kulasekararaj A, Iacobelli S, Terwel SR, Cook R, Griffin M, et al. Long-term outcomes in patients with severe aplastic anemia treated with immunosuppression and eltrombopag: a phase 2 study. *Blood.* 2022;139(1):34-43. <https://doi.org/10.1182/blood.2021012130>
11. Shinn LT, et al. Real-world outcomes with immunosuppressive therapy for aplastic anemia in patients treated at the University of Michigan. *Eur J Haematol.* 2024;112(1):113-122. doi:10.1111/ejh.14131. <https://doi.org/10.1111/ejh.14131>



Student's Journal of Health Research Africa

e-ISSN: 2709-9997, p-ISSN: 3006-1059

Vol.7 No. 3 (2026): September 2026 Issue

<https://doi.org/10.51168/bp99tz87>

Original Article

PUBLISHER DETAILS

Student's Journal of Health Research (SJHR)

(ISSN 2709-9997) Online

(ISSN 3006-1059) Print

Category: Non-Governmental & Non-profit Organization

Email: studentsjournal2020@gmail.com

WhatsApp: +256 775 434 261

Location: Scholar's Summit Nakigalala, P. O. Box 701432,
Entebbe Uganda, East Africa

