Autologous stem cell transplantation remains an effective strategy in mantle cell lymphoma in a Brazilian real-world cohort

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INTRODUCTION

Autologous stem cell transplantation (ASCT) remains a first-line consolidation option in mantle cell lymphoma (MCL). Its role is being reassessed in the era of targeted therapy, but evidence from resource-limited settings remains scarce. In Brazil, unequal access may modify the real-world value of ASCT.

AIM

To evaluate the association between first-line ASCT and overall survival (OS) and progression-free survival (PFS), and to examine treatment intensity and healthcare-system disparities in a real-world Brazilian MCL cohort.

METHODS

Retrospective multicenter study of 229 Brazilian patients with MCL. After exclusion of cases with insufficient data or rapidly progressive disease, 198 patients were included in the ASCT analysis and stratified according to first-line ASCT and transplant eligibility. OS and PFS were compared between groups, together with treatment intensity and healthcare-system access.

CONCLUSIONS

First-line ASCT was associated with the longest OS and PFS. Intensive chemotherapy without ASCT did not provide a comparable survival benefit. Lower access to rituximab, BTKi, and ASCT was observed in the public healthcare system, which was also associated with shorter OS.

RESULTS

1. PATIENT SELECTION AND ASCT GROUPS

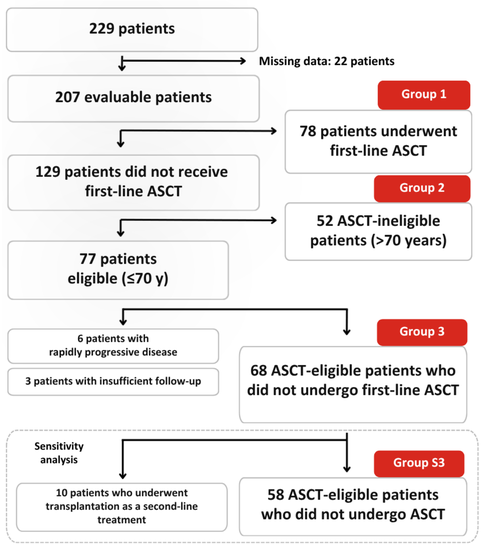

Figure 1. **Patient selection and ASCT groups.** Primary analysis: n=198 (OS available for n=193). Sensitivity analysis: n=188 (OS available for n=183), after excluding 10 patients who underwent ASCT following progression during second-line treatment.

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SUPPLEMENTARY MATERIALS / REFERENCES

Scan the QR code to view the full supplementary materials and reference list.

2. OVERALL SURVIVAL (OS)

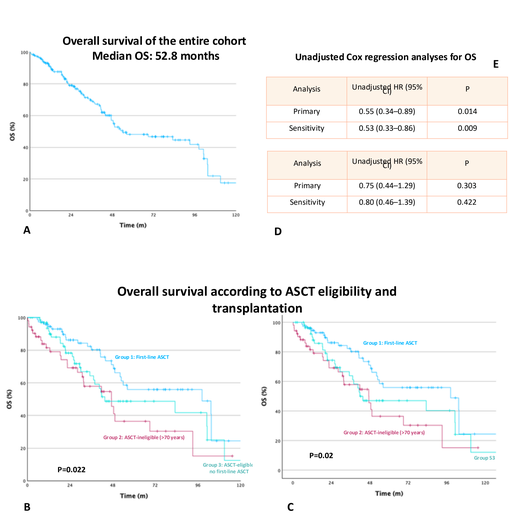


Figure 2. **Overall survival according to ASCT eligibility and transplantation.** (A) Kaplan–Meier estimate of OS for the entire cohort; median OS was 52.8 months. (B) Primary analysis comparing Group 1, Group 2, and Group 3. (C) Sensitivity analysis excluding patients who underwent ASCT as second-line treatment; Group S3 comprises eligible patients who never underwent ASCT. (D) Unadjusted Cox analyses comparing Group 1 with Groups 2+3. (E) Unadjusted Cox analyses comparing Group 3 with Group 2.

First-line ASCT was associated with superior overall survival. Compared with patients who did not undergo first-line ASCT, transplanted patients had a 45% lower hazard of death in the primary analysis (HR 0.55; 95% CI 0.34–0.89; P=0.014) and a 47% lower hazard in the sensitivity analysis (HR 0.53; 95% CI 0.33–0.86; P=0.009). Among non-transplanted patients, OS did not differ significantly between ASCT-eligible and ASCT-ineligible groups.

3. PROGRESSION-FREE SURVIVAL (PFS)

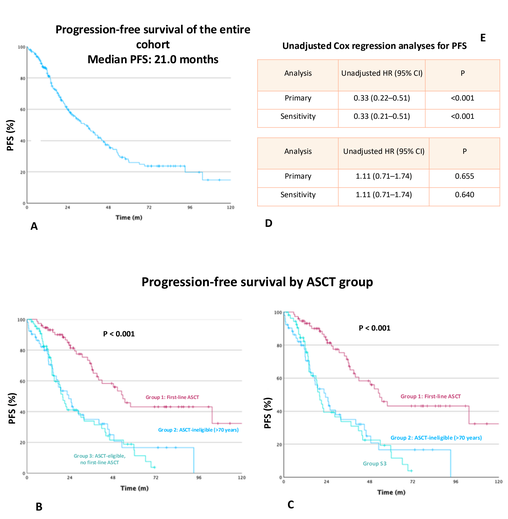


Figure 3. **Progression-free survival according to ASCT eligibility and transplantation.** (A) Kaplan–Meier estimate of PFS for the entire cohort; median PFS was 21.0 months. (B) Primary analysis comparing Group 1, Group 2, and Group 3. (C) Sensitivity analysis excluding patients who underwent ASCT as second-line treatment; Group S3 comprises eligible patients who never underwent ASCT. (D) Unadjusted Cox analyses comparing Group 1 with Groups 2+3. (E) Unadjusted Cox analyses comparing Group 3 with Group 2.

First-line ASCT was associated with superior progression-free survival. In unadjusted Cox analyses, first-line ASCT was associated with a lower hazard of progression or death in both the primary analysis (HR 0.33; 95% CI 0.22–0.51; P<0.001) and the sensitivity analysis (HR 0.33; 95% CI 0.21–0.51; P<0.001). Among non-transplanted patients, PFS did not differ significantly between ASCT-eligible and ASCT-ineligible groups.

4. TREATMENT STRATEGY AND OUTCOMES

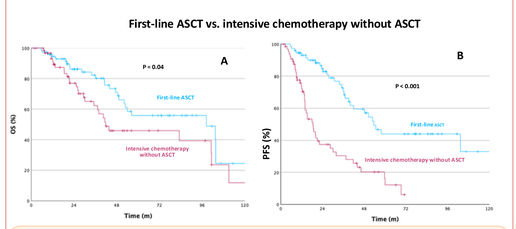


Figure 4. **Overall and progression-free survival according to first-line treatment strategy.** Kaplan–Meier analysis showed superior survival among patients who underwent first-line ASCT compared with those treated with intensive chemotherapy without ASCT, with significant differences in both overall survival (A; OS, P=0.04) and progression-free survival (B; PFS, P<0.001). In a supplementary analysis restricted to younger, transplant-eligible patients, the PFS benefit associated with first-line ASCT was maintained, supporting an effect of transplantation beyond chemotherapy intensity alone.

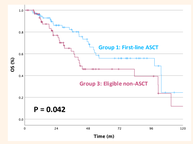
INTENSIVE CHEMOTHERAPY ALONE WAS INSUFFICIENT

Among transplant-eligible patients who did not undergo ASCT, high-intensity chemotherapy was not associated with improved OS (P=0.732) or PFS (P=0.396) compared with conventional regimens.

CONSISTENT OS BENEFIT WITH ASCT

First-line ASCT was associated with a lower risk of death in Cox regression. HR 0.53 (95% CI 0.33–0.86) | P=0.009

ASCT BENEFIT AMONG TRANSPLANT-ELIGIBLE PATIENTS



OS: First-line ASCT vs eligible non-ASCT
98.4 vs 41.8 months, **P = 0.042**

PFS: First-line ASCT vs eligible non-ASCT
53.5 vs 18.4 months, **P < 0.001**

Corresponding Kaplan–Meier curve available in the supplementary materials.

The survival advantage associated with first-line ASCT was not explained by chemotherapy intensity alone, supporting a meaningful role for ASCT consolidation in transplant-eligible patients.

5. HEALTHCARE-SYSTEM ACCESS AND OUTCOMES

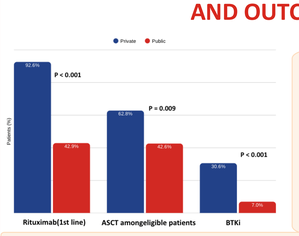
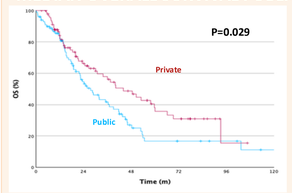


Figure 5. **Healthcare-system disparities in access to key therapies.** Access to rituximab in first-line therapy, ASCT among eligible patients, and BTK inhibitors (BTKi) was consistently higher in the private healthcare system compared with the public system.

ADJUSTED ANALYSIS

Private healthcare remained independently associated with:
- Higher odds of first-line ASCT among transplant-eligible patients (aOR 2.61; 95% CI 1.11–6.13; P=0.028);
- Lower hazard of death (aHR 0.38; 95% CI 0.20–0.74; P=0.005).

MEDIAN OVERALL SURVIVAL PUBLIC VS PRIVATE

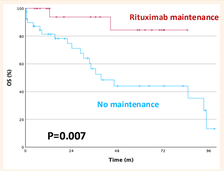


98.4 months · Private vs. **47.3** months · Public

Figure 6. **Overall survival according to healthcare system.** Kaplan–Meier analysis showed longer overall survival among patients treated in the private healthcare system compared with the public system (median OS, 98.4 vs. 47.3 months; P=0.029).

6. RITUXIMAB

Among patients undergoing first-line ASCT, **rituximab maintenance was associated with improved post-transplant OS** (log-rank P=0.007; aHR 0.17, 95% CI 0.04–0.74; P=0.018) **and PFS** (aHR 0.25, 95% CI 0.08–0.74; P=0.013), independent of healthcare system. Maintenance was more frequent in private than public care (45.2% vs 20.0%; OR 3.30; Fisher P=0.064).



Additional survival curves are provided in the Supplementary Material.

First-line rituximab use was substantially higher in private than public care (92.6% vs 42.9%; OR 16.57, 95% CI 6.96–39.47; P<0.001). Rituximab use was associated with longer PFS (41.8 vs 22.5 months; HR 0.57, 95% CI 0.38–0.85; P=0.006), while OS was numerically longer but not statistically significant.