Comparison of prognosis between patients with therapy–related myelodysplastic syndrome after hematological malignancies and myelodysplastic syndrome de novo: retrospective cohort study

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Background

Prognosis of patients with therapy–related myelodysplastic syndrome (t-MDS), developing after previous chemotherapy or radiotherapy therapy for primary hematological malignancies, is not well described. It is not clear if the prior history of hematological malignancy contributes to prognosis beyond the IPSS-R score. The primary aim of our research was to compare overall survival (OS) for patients with de novo MDS (d-MDS) and t-MDS after primary hematological malignancy and the secondary aim was evaluate the role of allo-HSCT in prognosis with patients with t-MDS.

Methods

A retrospective cohort single-center study included 94 patients: 23 with t-MDS with history of primary hematological malignancy and 71 with d-MDS. OS was assessed with Kaplan-Meier curves, and differences between groups were compared with the log-rank test. A multivariate Cox proportional hazard model was constructed to adjust for IPSSR-R prognostic group, age, and history of allo-HSCT.

Table 1. Patients baseline characteristics

	Therapy–related MDS N=23	De novo MDS (control group) N=71
Age at time of MDS diagnosis, median (range), years	46 (20-70)	46 (15-75)
Gender, m / f (%)	15/8 (65/35)	32/39 (45/55)
IPSS-R, n (%)		
Very low risk	0 (0)	0 (0)
Low risk	2 (9)	7 (10)
Intermediate risk	3 (13)	10 (14)
High risk	6 (26)	31 (44)
Very high risk	12 (52)	23 (32)
WPSS, n (%)		
Very low risk	2 (9)	2 (3)
Low risk	1 (4)	1 (1)
Intermediate risk	1 (4)	8 (11)
High risk	7 (31)	39 (55)
Very high risk	12 (52)	21 (30)

Resuts: t-MDS characteristics

Fig. 1: Preceding malignant neoplasm, n (%)

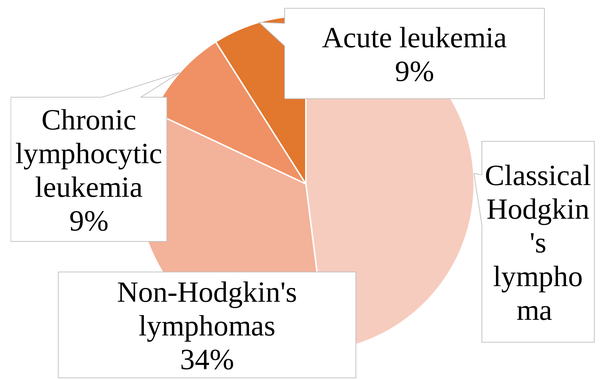


Fig. 2: Primary cancer status at the time of MDS diagnosis

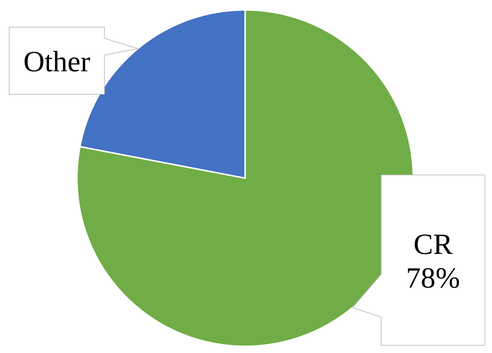


Fig. 3: Prior chemotherapy

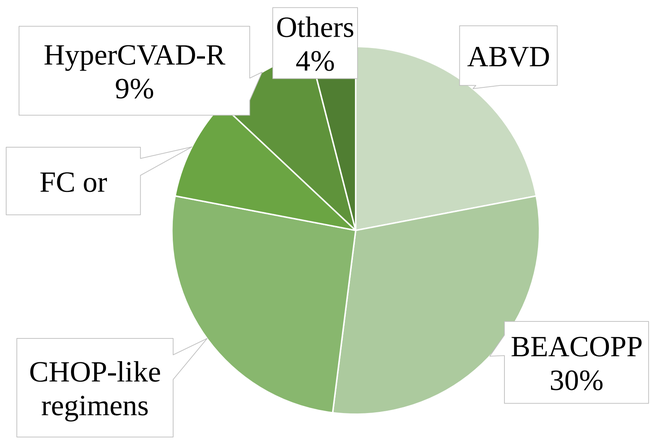
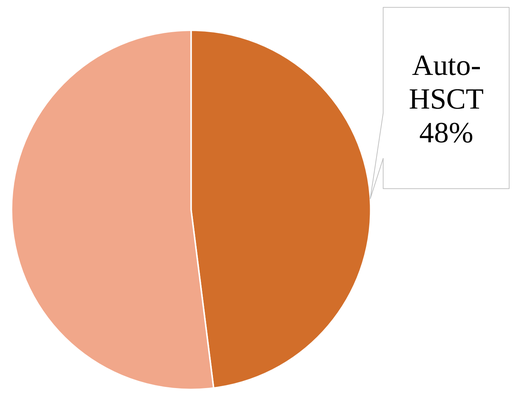


Fig. 4: Prior auto-HSCT



Median time from cytopenia to diagnosis of t-MDS was 1,5 months. Median time from diagnosis of primary cancer to t-MDS was 7 (2-19) years.

Fig. 5: Mutations

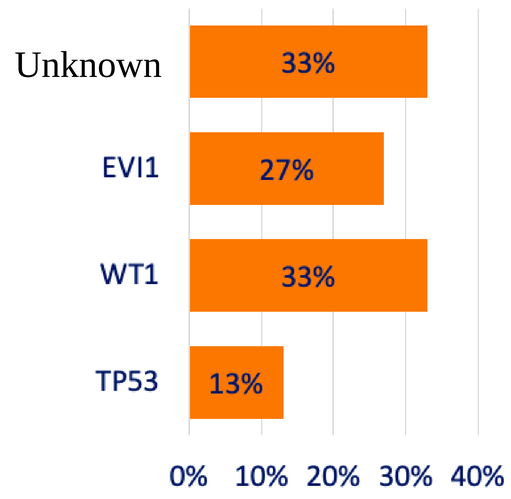
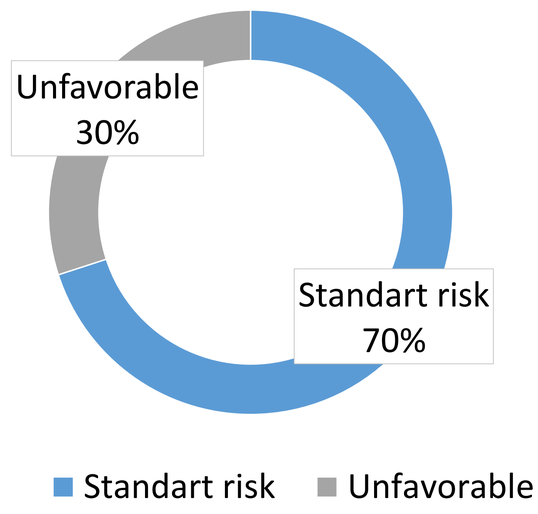


Fig. 6: Armand risk



Resuts: comparison of patients with t-MDS and d-MDS

All patients were included in the analysis with the median follow-up 10 and 37 months for t-MDS and d-MDS, respectively. OS rate was significantly lower for t-MDS compared to d-MDS (p=0.04, log-rank test) with median OS of 14 and 48 months, respectively. History of treatment primary hematological malignancy were independently associated with poor prognosis for patients beyond the IPSS-R and age (HR=1,9 [1,02;3,37], p=0,04). At the same time, including in the regression model allo-HSCT made this factor not significant (HR=1,2 [0,62;2,27], p=0,6).

Fig. 7: Overall survival patients with t-MDS and d-MDS (Kaplan Mayer curves)

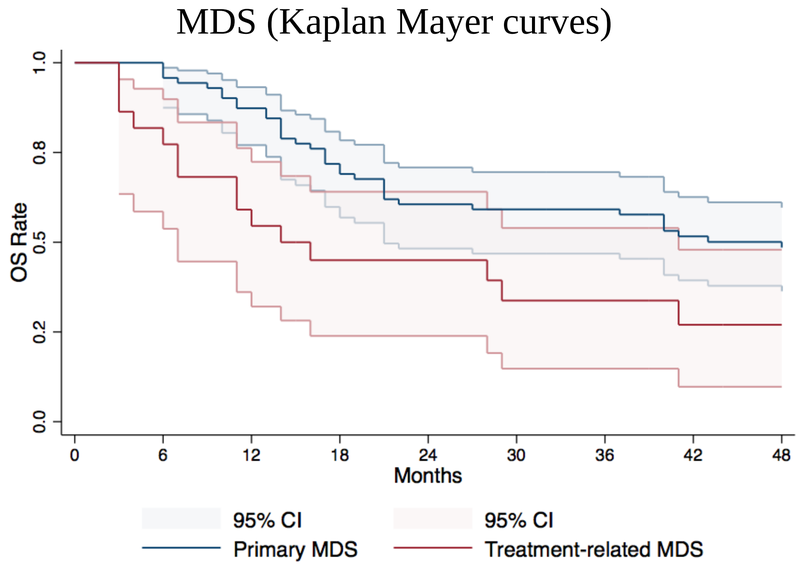


Fig. 8: Overall survival patients with t-MDS and d-MDS (Cox curves)

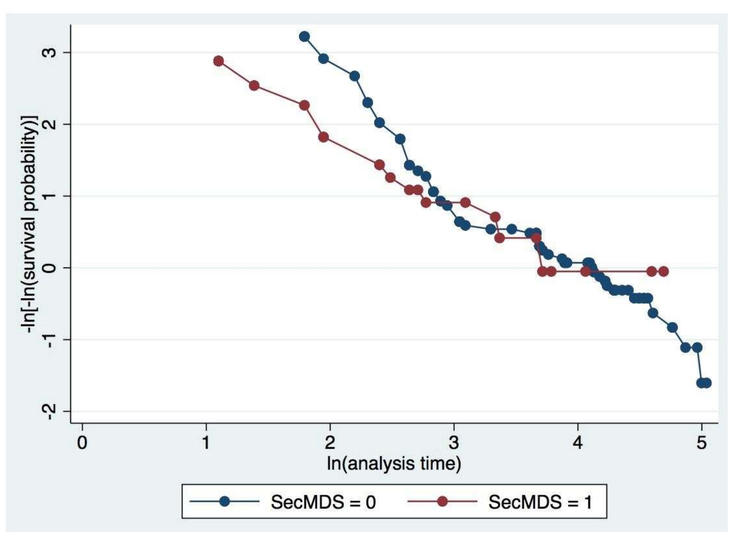
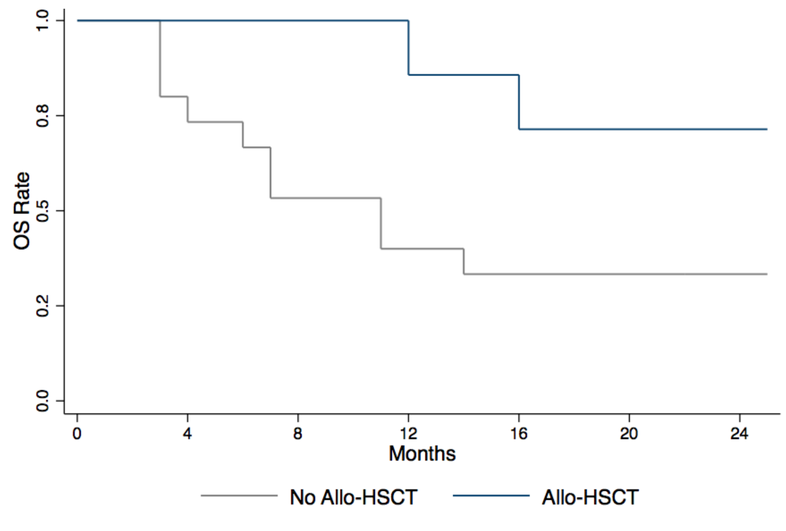


Fig. 9: Overall survival patients with t-MDS with o without Allo-HSCT



Conclusion

History of treatment of primary hematological malignancy can be independently associated with poor prognosis for patients with t-MDS beyond the IPSS-R and age, however uneven distribution of frequency of Allo-HSCT in groups can probably be confounder factor that leads to different prognosis between groups and requires further research.