INPLASY

Effect of RAS Pathway Gene Mutations on Survival in Myelodysplastic Syndrome

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ADMINISTRATIVE INFORMATION

Support - None.

Review Stage at time of this submission - Completed but not published.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202610049

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 15 January 2026 and was last updated on 15 January 2026.

INTRODUCTION

Review question / Objective To assess the impact of RAS pathway genes mutation on survival outcomes in adult patients with myelodysplastic syndrome.

Condition being studied Myelodysplastic neoplasms or myelodysplastic syndromes (MDS) 1 are a group of myeloid neoplasms marked by clonal proliferation of hematopoietic stem cells, genetic mutations, morphologic dysplasia, dysfunctional hematopoiesis leading to low counts of circulating blood cells and an increased risk of progression to acute myeloid leukemia (AML).

METHODS

Participant or population Adults with MDS.

Intervention RAS pathway mutations (NRAS, KRAS, or PTPN11).

Comparator Lack of RAS pathway mutations (NRAS, KRAS, or PTPN11).

Study designs to be included Observational.

Eligibility criteria To be included in this systematic review, studies had to meet all of the following criteria: (1) involve adult human participants; (2) assess the impact of a RAS pathway mutation (NRAS, KRAS, or PTPN11) on survival outcomes in MDS patients compared to those without the mutation; (3) report a hazard ratio (HR) or provide a Kaplan-Meier curve for overall survival (OS), leukemia-free survival (LFS) or leukemia transformation, (4) be published in English; (5) be a primary, original research study.

Information sources PubMed, Embase, Scopus, Web of Science, and the Gene Expression Omnibus (GEO).

Main outcome(s) Overall survival (OS), leukemia-free survival (LFS) or leukemia transformation.

Quality assessment / Risk of bias analysis Methodological Standards for Epidemiological Research (MASTER) scale.

Strategy of data synthesis The association between various mutations and clinical outcomes (OS, LFS and leukemia transformation) was investigated and summarized as HRs and their corresponding 95% confidence intervals (CIs), comparing outcomes between patients with and without the mutations. A random-effects meta-analysis was performed using the restricted maximum likelihood (REML) method to estimate the between-study variance. P-values less than 0.05 were considered statistically significant. Statistical analysis was conducted using Stata version 17.

Subgroup analysis None.

Sensitivity analysis None.

Language restriction Only studies conducted in English will be included.

Country(ies) involved The authors involved in this study are based in Qatar.

Keywords MDS – RAS – NRAS – KRAS – PTPN11 - Survival.

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