Association of Circulating Clonal Plasma Cells with Treatment Response in Patients with Newly Diagnosed and First-Relapse Multiple Myeloma

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Introduction

Multiple myeloma diagnosis is guided by IMWG criteria. Circulating plasma cells are typically absent under normal conditions but may appear in Multiple Myeloma. Flow cytometry detects circulating clonal plasma cells with ~80% sensitivity, though no standardized method exists.

Aim

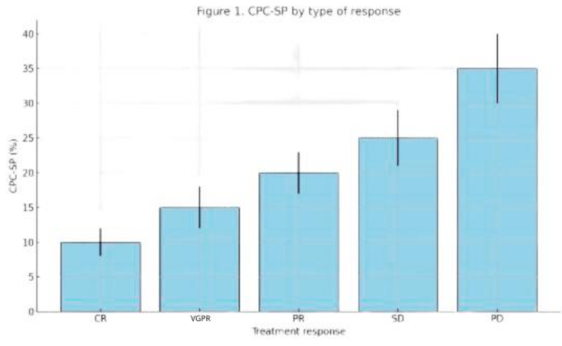
This study aims to explore the relationship between circulating clonal plasma cells and treatment response, and assess their prognostic value.

Objective

To determine the association between circulating clonal plasma cells and treatment response in newly diagnosed and first-relapse Multiple Myeloma patients.

Methods

A prospective analytical cohort study was conducted from February to June 2024 at the "20 de Noviembre" National Medical Center. Data was collected from medical records. Circulating clonal plasma cells were evaluated using FCM. Statistical analysis was performed using SPSS v29.0.



Interval Plot. The graph shows the different internal variables on the X-axis and CPC-SP on the Y-axis.**CPC-SP**: Circulating Clonal Plasma Cells; **CR**: Complete Response; **VGPR**: Very Good Partial Response; **PR**: Partial Response; **SD**: Stable Disease; **PD**:Progression.

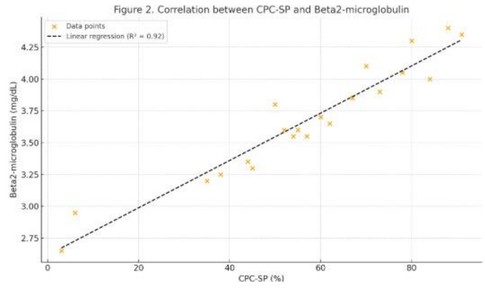
Results

Nineteen patients were included: 8 newly diagnosed and 11 in first relapse Multiple Myeloma. Median age was 62 years (range: 38–86); 63% were female. All patients had bone marrow plasmacytosis; 94% had a normal peripheral blood smear. ECOG scores were ≤1 in 62% and ≥2 in 36.7.

Median lab values: LDH 232 U/L, calcium 9.6 mg/dL, beta-2 microglobulin 2.52 mg/dL, albumin 3.6 mg/dL, creatinine 0.8 mg/dL, and CPC-FCM 19.7%. Disease subtypes included IgG (52.6%), IgA (26%), and light chain (21%). Most patients were classified as ISS II, R-ISS II, and DS IIIA. Cytogenetics were normal in 63%; abnormalities included del(17p)/TP53 (3 patients), t(4;14), IgH trisomy, and hyperdiploidy.

Treatment regimens included VTD (63%), VCD (21%), and others (15.5%). Responses were: 15.7% complete response, 15.7% very good partial response, 15.7% partial response, 5% stable disease, and 42% progression. CPCs were detected in 63% of patients (range: 0–99%).

ANOVA analysis showed no significant differences in treatment response across groups ($p = 0.30$). However, Pearson correlation revealed a strong association between beta-2 microglobulin levels and CPCs ($r = 0.825$, $p < .001$; 95% CI: 0.59–0.93).



Pearson Correlation Plot. The graph shows a scatter plot with beta-2 microglobulin on the X-axis and circulating clonal plasma cells on the Y-axis.

Summary

Although CPCs were not associated with clinical outcomes, their correlation with beta-2 microglobulin suggests potential for disease monitoring. Further research is warranted.

Discussion

Circulating clonal plasma cells (CPCs) have shown prognostic value in newly diagnosed multiple myeloma (NDMM), correlating with tumor burden and early relapse risk. However, their role in relapsed disease remains unclear. In this study of NDMM and first-relapse patients, we found no significant association between CPC presence and treatment response or recurrence risk.

Although CPC levels varied widely across clinical subgroups, no statistically significant differences were observed. A strong positive correlation was found between beta2-microglobulin and CPC counts ($p < .001$), suggesting a potential surrogate relationship.

Limitations include the small sample size (n=19) and lack of standardized flow cytometry protocols, which restrict external validity and comparison with other studies. Despite these limitations, our findings underscore the need for multicenter studies with standardized methodologies to clarify the prognostic role of CPCs in MM.

References

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