Clinical Significance of Circulating Cancer Associated Macrophage-Like Cells in Patients with Solid Tumors

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ABSTRACT

Blood-based biopsies can be used as a non-invasive method to recover a variety of cancer associated circulating cells, including Circulating Tumor Cells (CTCs) and circulating Cancer Associated Macrophage-like cells (CAMLs) from the blood of cancer patients. CAMLs are cancer specific giant polyloid cells circulating in the blood of patients with solid tumors. However, while CAMLs are easy to identify by their large size and polyloid nucleus, their expression of multiple heterogeneous markers have defied conventional characterization and have made study difficult using most isolation technologies. Because of this, since their discovery, few studies have been done to investigate their clinical and biological significance in cancer. A long term prospective study of CAMLs in patients with solid tumors (n=147; breast, prostate, and lung) was undertaken to elucidate the clinical significance of CAMLs to overall survival.

RESULTS

CAMLs were found in 90% of patients with confirmed malignant disease (n=132/147)
- CAMLs were found in 73% of stage I, 97% of stage II, 96% of Stage III, and 92% of Stage IV patients, regardless of cancer type (Fig. 2).
- CAMLs were found in 93% of prostate, 91% of lung, and 93% of breast patient samples.

Neither CAMLs nor CTCs, were found in any healthy individuals (n=40).
- Of the 86 patients remained on study for 2 years
  - 29 patients had ≥5 CAMLs/7.5mL and 35% (10 of 29) survived 24 months
  - 57 patients had <5 CAMLs/7.5mL, and 68% (39 of 57) survived 24 months
  - Hazard ratio was 2.5 (CI95% 1.5-6.2) p=0.004

CONCLUSIONS

CAMLs can be used as a non-invasive blood based biopsy, to detect the anatomical presence of solid malignancies.
- Morphological identification of CAMLs is straightforward by their extreme size and large nuclear profile.
- CAMLs are commonly found in all stages of malignancy.
- CAML number appears as a prognostic valuable as assessed by overall survival over a 24 month period.

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REFERENCES


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