Cancer Cell International

CANCER CELL INTERNATIONAL

BioMed Central

Oral presentation

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Migration of dendritic cells to regional lymph nodes in a vaccination trial

A Riccobon*[1], R Ridolfi[1], R Galassi[2], M Petrini[1], M Stefanelli[1], L Fiammenghi[3], G Giorgetti[4], A Moretti[2], L Ridolfi[1] and G Fiorentini[2]

Address: [1]Department of Medical Oncology, Pierantoni Hospital, Forlì, Italy, [2]Department of Nuclear Medicine, Morgagni Hospital, Forlì, Italy, [3]Istituto Oncologico Romagnolo, Forlì, Italy and [4]Department of Health Physics, Pierantoni Hospital, Forlì, Italy

Email: A Riccobon* - a.riccobon@ausl.fo.it

* Corresponding author

from Association for Immunotherapy of Cancer: Cancer Immunotherapy – 2nd Annual Meeting
Mainz, Germany, 6–7 May 2004

Published: 1 July 2004

Received: 28 April 2004

Cancer Cell International 2004, **4**(Suppl 1):S15

This article is available from: http://www.cancerci.com/content/4/S1/S15

Dendritic Cell (DC) vaccination is a very promising therapeutic strategy in cancer patients. The immunizing ability of DC is critically influenced by their migration activity to lymphatic tissue, where they prime naïve T cells. In the present study DC were differentiated from PBMC obtained by leukapheresis (7-day culture of adherent cells with IL-4 and GM-CSF). On day 7 the DC were defined as immature DC (iDC). After a transient (3 h) and continuous (48 h) stimulation with a cocktail of cytokines (IL-1β, IL-6, TNF-α, PGE2), the iDC were defined as transientlyDC (tsDC) and mature DC (mDC), respectively. During a phase I-II clinical vaccination trial for patients with advanced melanoma and renal carcinoma, we evaluated the migration ability of iDC, tsDC and mDC, and compared intradermal (*id*) and subcutaneous (*sc*) administration. DC were labelled with ^{99}Tc-HMPAO or ^{111}In-Oxine and the presence of labelled DC was detected in regional lymph nodes up to a maximum of 72 h after inoculation.

It was verified that *id* administration resulted in about a threefold higher migration to lymph nodes than *sc* administration. iDC and mDC migration was compared in 8 patients. mDC showed, on average, a six-to eightfold higher migration than iDC. The first DC were detected in lymph nodes after 20–60 min and the maximum concentration was reached 8 h-72 h after vaccination. In two patients a similar migration activity of mDC and tsDC was observed up to 36 h after inoculation.

These data confirm the validity of therapeutic vaccination with mDC administered intradermally. Further investigation is also needed to determine whether tsDC could be used in clinical vaccination trials to have a longer T cell activation and a more potent stimulation capacity.

Acknowledgements

Partially financed by Ministry of Health Research Project 2002, n.234.