Zirakzadeh et al. Journal for ImmunoTherapy of Cancer 2015, 3(Suppl 2):P65
http://www.immunotherapyofcancer.org/content/3/S2/P65

Journal for ImmunoTherapy of Cancer

POSTER PRESENTATION Open Access

B cells in tumor draining lymph nodes act as efficient antigen presenting cells in cancer patients

A Ali Zirakzadeh[1*], David Krantz[1], Malin Winerdal[1], Christian Lundgren[1], Ciputra Adijaya Hartana[1], Emma Ahlén Bergman[1], Johan Hansson[2], Benny Holmström[3], Alexander Sidiki[4], Janos Vasko[5], Markus Johansson[6], Per Marits[1], Amir Sherif[7], Ola Winqvist[1]

From 30th Annual Meeting and Associated Programs of the Society for Immunotherapy of Cancer (SITC 2015) National Harbor, MD, USA. 4-8 November 2015

Introduction

Overall Survival of patients with muscle invasive urothelial bladder cancer MIBC remains around 50% (5 years), albeit some improvements by combining neoadjuvant chemotherapy with radical surgery. Our previous work has demonstrated that *in vitro* expansions of sentinel node-acquired autologous tumor specific $CD4^+$ T cells are promising for adoptive immunotherapy [1]. In order for naive T helper cells to become activated, they need effective APCs, presenting tumor antigens. In another study, we observed that B cells in cancer patients were tumor antigen experienced and from their phenotypes we suggested a $CD4^+$ T cell dependent anti-tumoral response [2]. In this study, we report a flow cytometric investigation of tumor draining lymph node (sentinel node) derived B cell activation by autologous tumor extract in patients with MIBC.

Methods

Sentinel nodes (SNs) from 28 patients with MIBC were detected by a Geiger meter at cystectomy after peritumoral injection with radioactive isotope. Lymphocytes were isolated from freshly received SNs where they were stimulated with autologous tumor extract in a sterile environment. After cultivation for 7 days, the cells were analyzed by multi-color flow cytometry using FASCIA (Flow cytometric Assay of Specific Cell-mediated Immune response in Activated whole blood).

Results

Patients displayed an increased B cell activation in SNs after stimulation with autologous tumor extract compared to when SN acquired lymphocytes were stimulated with autologous extract of macroscopically non-malignant bladder. $CD4^+$ T cells from SNs were activated and formed blasts after co-culture with SN acquired B cells in the presence of tumor antigen. However, $CD4^+$ T cells were not activated and did not blast when co-cultured with B cells incubated with HLA-DR-blocking antibodies. This indicates antigen presenting ability of SN acquired B cells.

Conclusions

We demonstrate sentinel node acquired B lymphocytes can be activated in culture upon stimulation with autologous tumor extract but not with extract of non-malignant epithelium of the bladder, after 7 days. Lower number of sentinel node acquired $CD4^+$ T cells cultured with HLA-DR blocked $CD19^+$ cells in presence of tumor antigen, indicate functional antigen presenting ability of B cells in sentinel nodes. The role of B cells as APCs in human T cell anti-tumoral response should be further explored, as well as their usefulness in adoptive immunotherapy.

Authors' details
[1]Karolinska Institutet, Stockholm, Sweden. [2]Centre for Research and Development, Faculty of Medicine, Uppsala University, Uppsala, Sweden. [3]Department of Urology, Uppsala University Hospital, Uppsala, Sweden. [4]Department of Urology, Länssjukhuset Ryhov, Jönköping, Jönköping, Sweden. [5]Department of Medical Biosciences, Pathology Umeå University, Umeå, Sweden. [6]Departemnt of Urology, Sundsvall Hospital, Sundsvall, Sweden. [7]Department of Surgical and Perioperative Sciences, Urology and Andrology, Umeå University, Umeå, Sweden.

Published: 4 November 2015

References
1. Karlsson Marits, Dahl Dagöö, Enerbäck Thörn, Dagoo T, Enerback S, Thorn M, *et al*: **Study of Sentinel-Node-Based Adoptive Immunotherapy in Advanced Colorectal Cancer.** *Ann Surg Oncol* 2010, **17(7)**:1747-1757.

[1]Karolinska Institutet, Stockholm, Sweden
Full list of author information is available at the end of the article

2. Zirakzadeh AA, Marits P, Sherif A, Winqvist O: **Multiplex B cell characterization in Blood, lymph nodes and tumors from patinets with malignancies.** *J Immunol* 2013, **190(11)**:5847-5855.

doi:10.1186/2051-1426-3-S2-P65
Cite this article as: Zirakzadeh *et al.*: B cells in tumor draining lymph nodes act as efficient antigen presenting cells in cancer patients. *Journal for ImmunoTherapy of Cancer* 2015 **3**(Suppl 2):P65.