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Hadrontherapy, a new hope against radio- and chimio-resistant tumors

Karim Boumédienec
University of Caen, France

Cancer is the second cause of death in Europe. Better understanding mechanisms of resistance to current treatments (radiotherapy and chemotherapy) and identifying new therapeutic approaches capable of treating tumors resistant is a major public health concern. In this lecture, we will discuss our recent investigations on mechanisms of resistance to treatments of tumors, using chondrosarcoma model. In addition, this lecture will present a new approach to treat these tumors, i.e. hadrontherapy. The latter uses particles beams (mainly proton and ^{12}C ions) to irradiate tumors. ^{12}C beams present an enhanced biological efficiency and a ballistic advantage with a maximum energy deposition at the end of the path (i.e., Bragg peak). A large dose can be delivered inside a deep tumor while the surrounding healthy tissues are preserved. Consequently, these new forms of radiotherapy may become efficient tool to treat cancers.

Biography

Karim Boumediene completed his Ph.D. in 1996 from Université de Caen Basse-Normandie (France), and became Assistant Professor, then full Professor in 2008. He was the laboratory director of Laboratoire Matrice extracellulaire et Pathologie from 2003 to 2012. He is implicated in numerous national and international collaborative research programs and has published more than 45 papers in reputed journals. He also serves as reviewer and is an editorial board member. In addition, he is a member of scientific board of his university since 2007, and also member of the University National Council.

karim.boumediene@unicaen.fr

Risk of malignancy with insulin glargine (lantus) large diabetes registry data

Khalid Al-Rubeaan
King Saud University, Saudi Arabia

Diabetes mellitus is a chronic metabolic disorder that requires lifetime treatment. The advent of insulin marks one of the greatest innovations for the treatment of diabetes, in achieving and maintaining normoglycemic conditions to delay or abate the progression of chronic complications. Insulin glargine (A21Gly, B31Arg, B32Arg human insulin) is a long-acting insulin analogue that is used as basal insulin in people with diabetes and is given once daily. This insulin analogue with longer, non-peaking profile may decrease the risk of hypoglycaemia compared with NPH insulin. Recent epidemiological studies suggested an association of glargine with increased incidence of different types of malignancies.

To determine whether the treatment with insulin glargine (lantus) is significantly associated with increased incidence of malignancy among registered Saudi diabetic patients who used this type of insulin for the period between January 2003 till December 2010. 100,000 registered Saudi diabetic patients where electronically screened from the Saudi national diabetes registry, out of which 30,732 patients were using different types of insulin, of which 326 only used insulin glargine (lantus) alone. The rest where using different types of Insulin mainly regular, NPH, or mixed of both. Out of this group an identical matching sample with respect to gender, age, body mass index (BMI), diabetes duration, smoking and metformin use where randomly selected.

Looking for the end point of cancer occurrence after the insulin use, Saudi national diabetes registry data showed one case of adenocarcinoma of uncertain origin related to insulin glargine (lantus). While the matching insulin using patients treated with regular, NPH, or both insulin had six cases of cancer; (one case of leukaemia, one case of breast cancer, one case of colon cancer, one case of bladder cancer, one case of prostate cancer, and only once case of adenocarcinoma of unclear origin).

In conclusion, from the current available data of insulin glargine (lantus) users versus other type of insulin users, there was no increased risk of malignancy among insulin glargine users, keeping in mind that the mean insulin glargine use was around 1 year.

krubean@KSU.EDU.SA

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