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Cost-effectiveness of first generation nanotherapy: Comparing gemcitabine and PEGylated liposomal doxorubicin for recurrent or progressive ovarian cancer in Flanders

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Since chemotherapy frequently results in severe adverse events, nanobased agents are being considered as an alternative treatment for cancer. The latter, which is significantly more expensive (acquisition cost) will gain greater support if it can prove to be cost-effective. Comprehensive cost taxonomy is necessary and was used to examine the costs and cost-effectiveness of chemotherapy (gemcitabine) and a first generation nanotherapy (PEGylated liposomal doxorubicin) to treat ovarian cancer in a Flemish context. The base case used data reported in a phase III trial. To test to robustness of the model, results were subject to Monte Carlo analyses. As expected, initial drug costs were significantly higher for the nanotherapy. They were €2,830.93 compared with €595.76 for chemotherapy, a difference of €2,235.17 per patient in favor of chemotherapy. Hospitalization costs for nanotherapy were €2,197.02. They were significantly higher for chemotherapy, namely, €5,547.30, resulting in a difference of €3,350.28 per patient in favor of nanotherapy. Tangible indirect costs were in favor of the nanobased agent. They were estimated at €2,319.97 versus €2,492.33, a difference of €172.36 (without productivity costs). Productivity costs were as high as €35,495 for nanotherapy and €39,165.34 for chemotherapy per patient, resulting in a difference of €3,670.34. The cost per quality-adjusted life week (QALW) for the nanotherapy was estimated at €266.52/QALW compared with €417.22/QALW for chemotherapy. In Flanders, the clinical benefit associated with nanotherapy was achieved yielding not only positive cost-effectiveness results, but surprisingly also financial savings. Although more comprehensive analyses are necessary to corroborate these results, this analysis supports the further use of nanotherapy for ovarian cancer.

Biography

Rita Bosetti obtained her PhD in Applied Economics in 2012 at the age of 29 years from Hasselt University (Belgium) in collaboration with Professor Mauro Ferrari of the University of Texas – Health Science Center at Houston (USA). Currently, she has an appointment as a post-doctoral researcher at Hasselt University (Belgium). She has published several articles in a leading nanomedicine journal as well as in a chemistry journal, showing the multidisciplinary of her research.

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Three-dimensional surface reconstruction using scanning electron microscopy with four secondary electron detectors

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This presentation gives an overview of the possible methods for a three-dimensional surface acquisition in the micrometer scale. It is pointed out that Scanning Electron Microscopy is a capable method for measurement tasks of this kind; therefore, it presents possible ways for implementing this technique in a three-dimensional surface reconstruction. The improved photometric method promises the best performance; its further implementation is developed and explained. Therefore, some modifications of the employed Scanning Electron Microscope (SEM) are described, for instance, the integration of two supplemental detectors, a modified collector grid and a gun shielding. All modifications were evaluated using FEM-Simulations before their implementation. A signal mixing is introduced in order to still be able to use the improved photometric method with four detectors in spite of the fact that it was designed for a two-detector system. For verification purposes, a sphere normal is measured by means of the modified system. It can be seen that the maximal detectable slope angle could be increased compared to the old photometric method. In addition, we introduce an electron trap made from nanostructured titanium. The electron trap will later be implemented on the bottom of the electron gun to catch unwanted Backscattered Electron (BSE) emission which could otherwise affect the three-dimensional reconstruction.

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