



21/05/2018 12:24:41

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Area tematica

Breast cancer

Titolo

TEN-YEARS ELECTRONIC PHENOTYPING ARCHIVE AND AUTOMATED RECONSTRUCTION OF HER2+ BREAST CANCER PATIENTS CAREFLOW, THROUGH THE EXPORTABLE, OPEN-SOURCE I2B2 DATA WARE-HOUSING PLATFORM

Testo

BACKGROUND: The appropriateness of cancer-care plays a central role in modern oncology and the implementation of optimal patterns of care can improve quality metrics while achieving financial benefits and savings. Cancer careflows should address the full spectrum of the cancer journey, including diagnostic studies, cancer treatments and any other interventions of care. Unfortunately, the reconstruction of the cancer careflow is limited by the absence of integrated information in the hospital informatics system (HIS). In this project, the exportable, open-source, I2B2 data ware-housing platform was implemented to obtain an automated electronic phenotyping and accurate reconstruction of cancer careflows in HER2+ breast cancer (BC).

MATERIAL AND METHODS: I2B2 allows to build an integrated patients data ware-house, using a taxonomy of terms, international standards and personalized concepts. Inside the i2b2's database, all available different patients data-sources, already stored in the HIS, are fully integrated and freely queryable. Moreover, the system is able to automatically reconstruct the entire cancer careflows, by temporally-based data extraction algorithms. Through I2B2, we identified the consecutive HER2+ BCs treated at Papa Giovanni XXIII Hospital in the last decade, recording all clinical relevant data (demographics, pathology reports, drugs, clinical outcomes). In a consistent sample size of patients, we validated the I2B2-automatically extracted information through a manual review of the medical records.

RESULTS: From 2007 to 2017 we automatically identified and described 4,239 BC patients. 561 out of 4,239 (13.2%) were

HER2+ BCs. Among the HER2+ BCs, 531 (95%) had early-BC: 109 (20.5%) were HR-/N-, 72 (13.6%) were HR-/N+, 202 (38.0%) were HR+/N- while 113 (21.3%) were HR+/N+. Through freely interrogation of the I2B2, we obtained all specific information about diagnosis, cancer treatments and survival outcomes. Moreover, we were able to automatically reconstruct the full breast cancer patients' careflows, from diagnosis to the last follow up/exitus.

CONCLUSIONS: I2B2 is an exportable, open-source platform able to automatically and retrospectively retrieve and integrate information from different electronic databases, already stored in HIS. In this 10 years HER2+BC analysis, we demonstrated the ability of I2B2 to use the electronic phenotyping archive for an automated reconstruction of all BC patterns of care.

Parole Chiave

1. HER2 positive breast cancer
2. Automated electronic phenotyping
3. Cancer careflows reconstruction

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