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MRI and DWI: the future in cervical cancer?

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Editorial

Cervical cancer is the third leading cause of female cancer worldwide and is the second most common cause of cancer related deaths in women in undeveloped countries.[1] The incident rate varies with the prevalence of risk factors and the lack of adequate screening programs, reaching 80 cases per 100,000 inhabitants in Recife, Brazil.[2] Despite advances in treatment, cervical cancer still maintains high rates of morbidity and mortality – the recurrence rate and associated death is approximately 30%. Data from the UK show that one third of patients will die within 5 years of diagnosis. [3] For all these reasons cervical cancer can be considered a public health issue especially in developing countries.

The International Federation of Gynecology and Obstetrics (FIGO) stage system is the most widely used for cervical cancer. This system emphasizes the clinical parameters at the expense of morphological and functional examinations, which facilitates its applicability in developing countries - where additional tests are expensive and not available. The main limitations are the fact that this system is examiner dependent, difficult to reproduce, and difficult to perform in obese patients or those with unfavorable anatomy.

Although without altering the classification proposed by FIGO, exams are valuable in this disease as they tend to guide the practitioner toward more accurate treatment. Furthermore, they are important to assess the response to treatment, which is of paramount importance since additional therapies (i.e. hysterectomy) may be used in cases of persistent disease.

The 18-FDG PET stands out as the most used and studied functional test in cervical cancer. Unfortunately, PET is not available to many treatment centers around the world, especially in those that have the highest incidence rates – as the funds needed to obtain its tracer make it cost prohibitive.

In this context, a much more cost effective relation is the MRI. Stenstedt *et al.* [4] studied the impact of MRI in staging and follow-up of cervical lesions and concluded that the addition of this examination alter the staging proposed by FIGO and changes the treatment plan in many cases. In 2013, Kraljevic *et al.* [5] performed a study comparing the FIGO staging and MRI preoperatively and correlated these findings with the pathological outcome in patients treated surgically. They concluded that MRI is better than clinical staging (accuracy of 90.9% versus 79.0%).[5]

Novel advances such as diffusion weighted image (DWI) (sequence that is sensitive to the random motion of water molecules - i.e., Brownian motion) allow us to evaluate changes during therapy. Restriction to this diffusion movement is directly associated to the degree of cellularity of the tissue and thus is related to primary malignancy and metastasis.[6] An actual issue is whether its changes are predictive of response: the DWI derived apparent diffusion coefficient (ADC) is capable to quantify the magnitude of this water diffusion and has been used extensively as a biomarker for therapeutic response in many cancer types.

Emerging studies seek to consolidate the actual role of MRI and their different weights in the staging and therapeutic monitoring of cervical cancer. Advantages such as cost-effectiveness (pathology is predominant in developing countries) and absence of need of contrast (essential in cases where there is impairment of renal function) add to this exam key features to this pathology. It is not difficult to predict that if new studies demonstrate in practice these advantages, MRI/DWI could be considered essential in the future.

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