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Improving the cardiac fasting protocol in 18F-FDG PET/CT imaging

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18F-fluorodeoxyglucose positron emission tomography/computed tomography (FDG PET/CT) cardiac imaging provides added value in the evaluation of infection of cardiac implantable electronic devices, myocardial sarcoidosis, and suspected cardiac infection. In order to achieve an optimal cardiac imaging, it is essential that the patient follow the dietary instruction to suppress the physiologic FDG uptake by normal myocytes. A low carbohydrate diet followed by a fasting period before the scan can be implemented which can be challenging to follow in a ward environment due to multiple shift changes in staffing, and a lack of appreciation of the importance of the cardiac fast.

Following the introduction of the fasting protocol a number of patients were cancelled due to obvious non-compliance with the fast. Previous work has shown the difficulty of compliance with dietary instructions, with 24% demonstrating inadequate suppression. The aim of this study is to identify whether the introduction of a new protocol has made a difference in the compliance to the recommended diet plan in inpatients.

We designed a dietary preparation protocol after experiencing a sub-optimal compliance with dietary instructions. Between December 2017 and August 2018, 19 cardiac inpatients scans were performed at our PET/CT department. Patients were divided into 2 groups. Group 1 represents a total of 8 patients who underwent the initial protocol and group 2 a total of 11 patients who underwent the new protocol. Both groups followed a low carbohydrate diet for breakfast, lunch and dinner the day before the scan as well as a fasting period of 15 hours prior to appointment time. In addition, the technologist performing the test talked to the nurse looking after the patient to ensure that the preparation was followed. The introduction of laminated cards with patient preparation to place by the patient’s bed as well as a diet diary to be filled in by the patient/nurse was introduced to patients in group 2.

For each patient, a radiologist independently analysed the images and scored them as follows: 0: myocardium less than left ventricular blood pool (LVBP), 1: myocardium equal to LVBP, 2: myocardium greater than LVBP but less than liver, 3: myocardium focally greater than liver, 4: myocardium diffusely greater than liver.

The results before introducing the new protocol were as follows: 0:2, 1:2, 2:0, 3:1, 4:3. Group 2 results were 0:7, 1:0, 2:0, 3:1, 4:3. Adequate cardiac suppression (score=2) rose from 50% after protocol 1 to 64% after protocol 2.

The implementation of a new dietary preparation protocol has played an important role in the suppression of myocardial uptake and led to our patients being more compliant in following instructions. Although the results are not statistically significant, they suggest that a protocol such as this should be considered when adopting a cardiac fasting protocol for 18F-FDG PET/CT scan.