

THE EFFECT OF THE COVID-19 PANDEMIC ON BMI AND RADIOGRAPHIC SEVERITY OF OSTEOARTHRITIS IN PATIENTS AWAITING TOTAL KNEE REPLACEMENT – Jack Thomson, CDF in Orthopaedic Surgery

Introduction:

- Obesity increases the risk of some postoperative complications following Total Knee Replacement (TKR) (Wallace et al., 2014).
- The Covid-19 pandemic has significantly increased operative waiting times.
- This study examined changes in Body Mass Index (BMI) and radiological severity of osteoarthritis, by Kellgren-Lawrence (KL) grading (Fig 1.), seen whilst awaiting surgery.

Methods:

- Data was collected retrospectively regarding 54 patients who attended the pre-assessment-clinic (PAC) from January-March 2022, prior to undergoing TKR.
- This data included: demographic information, waiting times, BMI on referral to Orthopaedics versus BMI at PAC, KL-grading on referral versus on follow-up films.

Kellgren-Lawrence grading scale					
X-Ray					
OA Grade	Grade 0 (Normal)	Grade 1 (Doubtful)	Grade 2 (Mild)	Grade 3 (Moderate)	Grade 4 (Severe)
JSN	No radiographic features of OA are present	Doubtful	Possible	Definite	Marked
Osteophytes		Possible	Definite	Multiple	Large

Figure 1. Kellgren-Lawrence radiological grading scale for Osteoarthritis. (Muhammad and Yeasin, 2021)

Demographic information	
Number of Patients	54
Mean Age in Years (Standard Deviation)	69.1 (8.07)
Male/Female Split	25/29

Table 1. Demographic breakdown of patients studied

Results:

- Demographic information of the patients studied can be seen in Table 1.
- Categorical breakdown of waiting time for surgery can be seen in Figure 3. Mean wait for surgery was 191.5 days (SD 114.23)
- 33 of 54 patients were obese (BMI ≥ 30) when listed for surgery, mean BMI was 31.7 (SD 4.59).
- Mean BMI at PAC was 33.2 (SD 4.97), mean change of +1.5 (SD 2.51) since listing, P-value = 0.111. The percentage of patients who increased/decreased/saw no change in their weight can be seen in Figure 2.
- Mean KL-grading on referral was 3.65 (SD 0.48); 34.6% graded 3, 65.4% graded 4. 15.4% received follow-up X-Rays. 1 patient's grading worsened (from 3 to 4).

Weight Change Whilst Awaiting Surgery

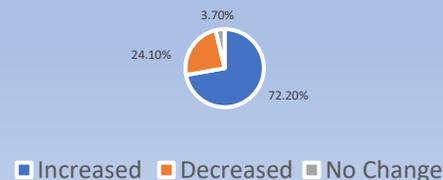


Figure 2. Percentage of patients who increased//decreased/saw no change in their weight whilst awaiting surgery



Figure 3. Categorical breakdown of waiting time for surgery

Conclusion:

- Operative waiting times in the patients studied were considerably higher than NHS Fife pre-pandemic targets (<3 months).
- 72.2% of patients gained weight whilst awaiting surgery.
- Mean BMI did not increase significantly whilst awaiting surgery, therefore, risk of weight-related complications is likely unchanged.
- No significant deterioration in KL grading was found. Follow-up x-rays numbers were low, but disease-related inactivity may preserve remaining joint surface.

References:

- Wallace, G., Judge, A., Prieto-Alhambra, D., de Vries, F., Arden, N. K., & Cooper, C. (2014). The effect of body mass index on the risk of post-operative complications during the 6 months following total hip replacement or total knee replacement surgery. *Osteoarthritis and cartilage*, 22(7), 918-927.
- Bany Muhammad, M., & Yeasin, M. (2021). Interpretable and parameter optimized ensemble model for knee osteoarthritis assessment using radiographs. *Scientific Reports*, 11(1), 1-11.