number of patients, the ML algorithms used, the type of data analyzed, the validation methods, and the data availability were collected.

Results: From 1,148 screened articles, 46 were selected and analyzed, most of which were published after 2017 (Figure 1). Twelve articles were related to diagnosis, 7 to prediction, 4 to phenotyping, 12 to severity and 11 to progression. The number of patients included ranged from 18 to 5,749. Deep learning (DL) was used in 35% of the cases. Imaging analyses represented 74% of the studies. Knee OA was studied in 85% of these articles while 15% investigated hip OA. None were on hand OA. Most of the studies were done on the same cohort with data from the Osteoarthritis Initiative (OAI), used in 46% of the articles whereas the Multi-Center Osteoarthritis Study (MOST) and the Cohort Hip and Cohort Knee Study (CHECK) cohort were respectively used in 11% and 7% of the articles. Data and source code were publicly available in 54% and 22% of the articles. External validation was provided in only 7% of the articles.

Figure 1. Article selection flow chart

Conclusion: This review provides a comprehensive update of ML in OA research. The number of ML articles in OA has increased exponentially over the last 5 years with applications across all major research themes. However, there is methodological heterogeneity, with articles based mainly on radiological data, but also on knee OA. To date, there is no ML article on digital osteoarthritis. This work also shows the need to develop clinical cohorts to bring more diversity in ML work and to allow external validation. This article is the first systematic review of the literature in OA and provides an overview of ML in OA, its applications, limitations and perspectives.

Disclosure of Interests: Marie Bivinigrat: None declared, Valentina Pedia: None declared, Atul Butte Shareholder of: a minor shareholder in Apple, Facebook, Alphabet (Google), Microsoft, Amazon, Snap, 10x Genomics, Illumina, CVS, Nuna Health, Assay Depot, Vezziveken, Regeneron, Sanofi, Roquette Pharma, AstraZeneca, Moderna, Biogen, Parable, and Sutro, and several other non-health related companies and mutual funds, Speakers bureau: invited talks from Johnson and Johnson, Roche, Genentech, Pfizer, Merck, Lilly, Takeda, Varian, Mars, Siemens, Optum, Abbott, Celgene, AstraZeneca, AbbVie, Westat, and many academic institutions, medical or disease specific foundations and associations, and health systems, Paid instructor for: boards for Geisinger Health, Regenstrief Institute, Gerson Lehman Group, AlphaSights, Covance, Novartis, Genentech, and Merck, and Roche, Consultant of: Personalis and NuMedii: consultant to Samsung, Mango Tree Corporation, and in the recent past, 10x Genomics, Helix, Pathway Genomics, and Verinata (Illunima), Grant/research support from: NIH, Northrup Grummman (as the prime on an NIH contract), Genentech, Johnson and Johnson, FDA, Robert Wood Johnson Foundation, Leon Lovenstein Foundation, Intervalien Foundation, Priscilla Chan and Mark Zuckerberg, the Barbara and Gerson Bakar Foundation, and in the recent past, the March of Dimes, Juvenile Diabetes Research Foundation, California Governor's Office of Planning and Research, California Institute for Regenerative Medicine, L'Oreal, and Progenity., Karine Louat: None declared, David Klatzmann: None declared, Francis Berenbaum: None declared, Encarna Mariotti-Ferrand: None declared, Jérémie SELLAM Consultant of: MSD, Pfizer, Abbvie, Fresenius Kabi, BMS, Roche Chugai, Sanofi, Lilly, Gilead, Novartis, Janssen, and grant research from Pfizer, MSD, Schwa Medico, BMS.


POS110 WHAT FACTORS ARE ASSOCIATED WITH THE DEVELOPMENT OF PAIN AFTER TOTAL JOINT REPLACEMENT?

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Background: Chronic postoperative pain (CPP) is one of the most common complications of total hip (HJ) and knee (CJ) arthroplasty (TA). The search for the factors that determine this pathology is an urgent scientific and practical task. Objectives: To determine the factors associated with the development of CPP in patients who underwent TA, CJ or HJ. Methods: The study group consisted of 124 patients with osteoarthritis of the knee or hip joint, mean age 63.6±9.9 years, 63% of women and 37% of men, who in 2019-2020 year done out by TA KJ or TA HJ. The development of CPP was assessed after 3 and 6 months. telephone survey of patients. This complication was diagnosed in the presence of moderate to severe pain (>40 mm on a visual analogue scale, VAS), persisting for at least 3 months, causing concern in patients and/or requiring regular use of analgesics. A comparison was made between the groups of patients with CPP and the absence of CPP for a number of factors determined in the preoperative period.

Results: The incidence of CPP was 27.4%. There were no differences in the incidence of CPP in patients who underwent TA CJ and TA HJ: 28.1% and 26.9%, respectively (p=0.88). The presence of CPP was significantly associated with such preoperative indicators as a higher body mass index (BMI), a higher intensity of pain at rest, higher values of the WOMAC pain index, WOMAC and WOMAC stiffness in general, and the severity of symptoms of neuropathic pain. (PainDetect questionnaire), signs of depression and anxiety (HADS questionnaire). The risk of developing CPP was significantly higher (p<0.05) in patients

POS109 GENETIC MARKERS PREDICT THE DEVELOPMENT OF POSTOPERATIVE PAIN

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Background: Postoperative pain (POP) is a serious complication that affects the outcome of total arthroplasty (TA) of the knee (CJ) and hip (HJ) joints in patients with osteoarthritis (OA). The search for the genetic characteristics of POP is an urgent direction in the study of this problem. Objectives: To determine the relationship between the polymorphisms of the KCNS1, COMT, and OPRM1 genes and the development of postoperative pain in patients with osteoarthritis of the knee joint and hip joint who underwent total arthroplasty.

Methods: The study group consisted of 95 patients with knee osteoarthritis and/or hip joint osteoarthritis (64.6% of women; mean age - 65.4 ± 9.0 years) who underwent TA CJ (472%) or TA HJ (52.2%). The presence of POP was determined when it persisted or appeared after 3 and 6 months. After surgery, pain in the area of the operated joint ≥40 mm by 100 mm visual analogue scale. All patients underwent genotyping of KCNS1 (rs734784, COMT (rs86269, rs4633), and OPRM1 (rs1799971) gene polymorphisms by real-time polymerase chain reaction using original sequence-specific primers and probes labeled with various fluorescent labels. Registration and interpretation of the obtained results were carried out on a DT-98 amplifier (DNA-Technology LLC, Russia).

Results: POP was observed in 32.6% of patients who underwent TA CJ or TA HJ. The incidence of POP after TA CJ and TA HJ was 30.2% and 34.0%, respectively (p = 0.882). There were no differences in the frequencies of genotypes of the studied genes (p>0.05). The presence of the homozygous GG genotype of the KCNS1 gene polymorphism (rs734784) was associated with the presence of POP in accordance with the recessive genetic model (GG vs AA + AG; odds ratio (OR) - 3.96 [95% confidence interval (CI): 1.51; 10.37]; p = 0.005). The presence in the genotype of the minor allele T (TT + CT) of the COMT polymorphism (rs4633) reduced the risk of developing POP compared with the carriage of the CC genotype (OR = 0.32 [95% CI: 0.12; 0.83]; p = 0, 02) according to the dominant genetic model. There was no statistically significant correlation between the development of POP and the carriage of various genotypes and alleles of the COMT (rs86269) and OPRM1 (rs1799971) genes.

Conclusion: There is a statistically significant association between the polymorphism of the KCNS1 (rs734784) and COMT (rs4633) genes and the development of chronic POP in patients who underwent TA CJ and TA HJ. Further studies of the genetic predisposition to POP are required using more clinical material.

Disclosure of Interests: None declared


POS110 WHAT FACTORS ARE ASSOCIATED WITH THE DEVELOPMENT OF PAIN AFTER TOTAL JOINT REPLACEMENT?

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