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2021 GRAPPA Trainee Symposium: A Summary of Oral and Poster Presentations

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ABSTRACT. The Group for Research and Assessment of Psoriasis and Psoriatic Arthritis (GRAPPA) held a trainee symposium at its 2021 virtual meeting. Dermatology and rheumatology trainees presented their work on psoriasis and psoriatic arthritis (PsA). This report briefly reviews 5 oral presentations: prediction of cardiovascular events in psoriatic disease (PsD), correlation between spine abnormalities and clinical findings, biomechanical stress as a trigger for PsA, differences in DNA methylation among twins with PsD, and critical proteins associated with induction of PsD. In addition, we highlight 22 posters broadly discussing clinical and molecular implications of PsD.

Key Indexing Terms: GRAPPA, psoriasis, psoriatic arthritis

At the 2021 annual Group for Research and Assessment of Psoriasis and Psoriatic Arthritis (GRAPPA) meeting, a trainee symposium was held, allowing trainees to showcase new research findings in psoriasis (PsO) and psoriatic arthritis (PsA) within a larger PsO and PsA community. This session was well attended by stakeholders from clinician, researcher, patient, industry, and policy communities. Professors April Armstrong and Elaine Husni facilitated the scientific exchange on topics surrounding PsO and psoriatic disease (PsD), and moderated the question-and-answer portion, where the presenters answered questions from the audience. The following are summaries of the oral presentations, followed by the poster presentations.

Oral Presentations

1. *Keith Colaco, MSc (Toronto, Canada); Senior Principal Investigator: Lihi Eder, MD, PhD*. In patients with PsD, we investigated the association of serum metabolites with cardiovascular (CV) events and determined whether metabolites could improve CV risk (CVR) prediction beyond traditional risk factors. Using nuclear magnetic resonance metabolomics, we identified biomarkers for CV events in 977 patients with PsD, among whom 70 had incident CV events. In Cox regression models adjusted for CVR factors, alanine, tyrosine, degree of unsaturation of fatty acids, and high-density lipoprotein particles were associated with decreased CVR. Glycoprotein acetyls, apolipoprotein B, and cholesterol remnants were associated with increased CVR. An age- and sex-adjusted expanded model with 13 metabolites significantly improved prediction of CV events beyond the model with age and sex alone, with an area under the receiver-operating characteristic curve of 79.9 vs 72.6, respectively ($P = 0.02$). Further study of the underlying causal role of these novel metabolites may clarify important pathways leading to CV events in patients with PsD.

2. *Pamela Diaz, MD (Toronto, Canada); Senior Principal Investigator: Lihi Eder, MD, PhD*. In this retrospective study of patients with PsA or PsO and suspected axial PsA (axPsA), we investigated the presence of spondyloarthritis (SpA; spondylitis and/or sacroiliitis) based on magnetic resonance imaging

As part of the supplement series GRAPPA 2021, this report was reviewed internally and approved by the Guest Editors for integrity, accuracy, and consistency with scientific and ethical standards.

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We have obtained ethical approval and informed consent if and when applicable.

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(MRI-SpA), and its agreement with inflammatory back pain (IBP) and the classification criteria for axial SpA (axSpA). We identified 93 patients with MRI of the whole spine and sacroiliac joints, which were centrally read. Only 9.7% of patients classified as MRI-SpA according to the Assessment of SpondyloArthritis international Society (ASAS) definition, and 12.9% according to radiologist impression (considering inflammatory and structural lesions). IBP by 3 definitions (ASAS, Berlin, rheumatologist criteria) showed a low agreement with the MRI. Rheumatologist criteria was the most sensitive for MRI-SpA (50–56%), whereas ASAS and Berlin criteria were more specific (62–62%). Classification criteria for axSpA also showed poor sensitivity for MRI-SpA (22.2–25.9%). Late onset of back pain and asymptomatic cases accounted for most cases with MRI-SpA not meeting the axSpA or IBP criteria. Clinical and epidemiological differences between axPsA and other axSpA may explain these findings. This study was funded by a Spondyloarthritis Research and Treatment Network (SPARTAN) fellowship grant.

3. *David Simon, MD (Erlangen, Germany); Senior Principal Investigator: Georg Schett, MD*. In PsD, biomechanical stress can trigger entheseal inflammation and the onset of disease. In this interventional study, we aimed to test whether intensive physical stimulation of the musculoskeletal system by playing badminton leads to an immediate inflammatory response at entheseal sites. We assessed entheses in competitive badminton players before and immediately after a 60-minute intensive training session. Power Doppler (PD) signal using ultrasound was assessed in the insertion sites of both Achilles tendons, patellar tendons, and lateral humeral epicondyles, and quantified using a validated scoring system. Thirty-two badminton players were included and 192 entheseal sites were examined twice. The respective empirical total scores for PD examination were 0.1 (0.3) before and 0.5 (0.9) after training. The mean total PD score difference of 0.4 between pre- and posttraining was significant ($P = 0.001$). A mixed effects model showed a significant increase of PD scores after training, with a mean increase per site of 0.06 (95% CI 0.01–0.12, $P = 0.02$). In conclusion, ultrasound assessment of the entheses 1 hour after high-impact training in healthy individuals showed a significant increase in PD activity at entheseal sites. These results underline the concept of mechano-inflammation and warrant further assessment in a population with known risk factors for developing PsD.

4. *Dr. Matteo Vecellio (London, UK); Senior Principal Investigator: Carlo Selmi, MD, PhD*. Genetics is insufficient to explain PsD onset as illustrated by uninformative genome-wide association studies and monozygotic (MZ) twins studies previously performed. Epigenetics may contribute to disease susceptibility–modulating gene expression. We have analyzed the DNA methylation profile of a selected cohort (n = 7 couples) of MZ twins discordant for PsD. DNA from whole blood was extracted to perform methylation using the Infinium MethylationEPIC BeadChip. We identified 2564 differentially methylated positions (DMPs; $P < 0.005$) with 19 genes potentially affected, including 7 with a concordant β-value variation. ChromHMM functional annotation identified transcription overlapping with associated DMPs in blood cells ($P < 10^{-10}$). *SNX25*, a negative regulator of TGFb pathway, *SMAD3*, and *SMARCA4*/BRG1 involved in chromatin remodeling and TGFb signaling, showed a differential methylation profile. Gene Ontology analysis of DMP-associated genes showed a significative enrichment ($P < 0.005$) in SMAD binding and histone-lysine-N-methyltransferase activity. The results obtained were validated with 5′-methylcytosine immunoprecipitation followed by real-time PCR and transcriptomic analysis. Our results suggest the presence of an epigenetic signature in individuals with PsD.

5. *Dr. Raminderjit Kaur (Ohio, USA); Senior Principal Investigators: Unnirishnan M. Chandrasekharan, PhD, and M. Elaine Husni, MD, MPH*. According to the new American College of Rheumatology/National Psoriasis Foundation (NPF) treatment guidelines, tumor necrosis factor inhibitors (TNFi) have been recommended as the first-line therapy for active PsA. However, long-term use of TNFi can lead to higher incidences of adverse effects, including serious infections and malignancies, which are implicated to inhibition of TNF receptor-1 (TNFR1; as opposed to TNFR2). Our group has been investigating the functional differences between the 2 TNF receptors (TNFR1 and TNFR2), as relative signaling contribution from these receptors may have widespread implications for the treatment of immune-mediated diseases such as PsA. Therefore, there is an unmet need to develop safer therapies. In our previous study, we identified that protein arginine methyltransferases 5 (PRMT5) is a critical TNF-α signaling intermediate. This makes PRMT5 a potential target in TNF-α–dependent inflammatory responses. Our data confirm the significant role of PRMT5 in TNF-α induction of PsD-related genes ($P < 0.01$). Further, using a nuclear factor-κB (NFκB) promoter–luciferase reporter system, we found that PRMT5 depletion significantly inhibits TNFR2, but not TNFR1-mediated NFκB activation ($P < 0.001$). We propose that targeting TNFR2 (and not TNFR1) through PRMT5 may reduce adverse effects associated with anti-TNF agents. This work is supported by NPF Bridge Grant no. NPF1808UC, awarded to UMC and MEH.

POSTER PRESENTATIONS

1. *Yasser Abdelhafez, MD (California, USA); Senior Principal Investigator: Siba Raychaudhuri, MD*. Dr. Abdelhafez and team sought to validate total-body (TB) 18F-fluorodeoxyglucose (FDG) positron emission tomography (PET)/computed tomography (CT) imaging as a diagnostic tool for PsA. His prospective study evaluated this imaging technique for 3 rheumatic diseases: rheumatoid arthritis (RA; n = 6), PsA (n = 14), and osteoarthritis (OA; n = 13). All subjects underwent a single-timepoint TB-PET/CT scan using the PET radiotracer 18F-FDG, a marker for glucose metabolism. In participants with PsA, increased uptake was noted in areas of enthesitis (n = 14/15), large and asymmetric joints (n = 15/15), and the nail matrix (n = 9/15). In addition, the uptake patterns and image intensity differed significantly in patients with PsA in comparison to those with RA or OA. Further, the PET findings exhibited a fair correlation of 68% with Disease Activity Index for Psoriatic Arthritis (DAPSA) scores. In conclusion, the authors of this study propose PET/CT scan imaging as a potential novel diagnostic tool for PsA.

2. *Juan Arguello, MD (Buenos Aires, Argentina); Senior Principal Investigator: Rodrigo Garcia Salinas, MD*. Dr. Arguello and team aimed to identify distinguishing features of early PsA (ePsA) in patients with previously diagnosed polyarthralgia given the limited available data on the frequency of PsA in the setting of musculoskeletal pain. This prospective cohort study identified 746 patients from August 2017–2020 in the Rheuma-Check program who were admitted for musculoskeletal pain and arthralgias. ePsA diagnosis was established using ClASsification for Psoriatic ARthritis (CASPAR) criteria. The frequency of ePsA was 9.5% in this cohort. In addition, ePsA diagnosis was significantly associated with a personal history of PsO (odds ratio [OR] 563.3), family history of PsO (OR 102.9), number of swollen joints (OR 1.4), radiographic erosions (OR 9.5), and ultrasound of ≥ 1 joint with positive PD signal (OR 20.2). Thus, these authors concluded that ePsA is an important diagnosis to consider in patients who present with musculoskeletal pain and/or polyarthralgias.

3. *Gizem Ayan, MD (Ankara, Turkey); Senior Principal Investigator: Umut Kalyoncu, MD*. Given the multitude of disease manifestations in PsA, an optimal screening tool is still an unmet need. Thus, Dr. Ayan aimed to develop a new screening tool utilizing a combination of questions from preexisting screening methods. A systematic literature review was conducted on PubMed up to August 2020 to assess the existing screening tools available for PsA. The tools evaluated included the following: Psoriasis Epidemiology Screening Tool (PEST), Psoriatic Arthritis Screening and Evaluation (PASE) questionnaire, Early Arthritis for Psoriatic Patients (EARP), Screening Tool for Rheumatologic Investigation in Psoriatic Patients (STRIPP), Simple Psoriatic Arthritis Screening (SiPAS), Siriraj Psoriatic Arthritis Screening Tool (SiPAT), Toronto Psoriatic Arthritis Screen II (ToPAS II), GErman Psoriasis ARthritis Diagnostic (GEPARD) questionnaire, Psoriasis and Arthritis Screening Questionnaire (PASQ), and CONTEST. Overall, 85 topics were queried for the Delphi set, including questions on joint, dactylitis, enthesitis, back, skin-nail domains, as well as morning stiffness, function, and treatment, among others. Seventeen experts (9 dermatologists, 8 rheumatologists) and 15 patients with PsA evaluated the Delphi set for the best candidate questions to screen for PsA. Nine questions involving different disease domains (joint, dactylitis, enthesitis, axial) were carried onto the second round of evaluation. In conclusion, the Delphi set could be the first step in creating an optimal screening tool for PsA.

4. *Julia Berman, MD (Tel Aviv, Israel); Senior Principal Investigator: Victoria Furer, MD*. Dr. Berman and team investigated the efficacy of treating PsA with ixekizumab (IXE) following secukinumab (SEC) failure in resistant populations. Her study arose amid growing evidence of successful switching between anti–interleukin (IL)-17 agents. This retrospective observational study identified 23 patients across 2 rheumatology centers in Israel with a history of SEC treatment followed by IXE treatment for at least 3 months. Disease activity indices (DAPSA, Simplified Disease Activity Index [SDAI], total joint count [TJC]) were measured at 6 and 12 months after IXE initiation. Median SEC treatment time was 15 months. DAPSA levels significantly decreased at 6- and 12-month intervals ($P = 0.02$, $P = 0.03$), whereas TJC ($P = 0.03$, $P = 0.02$) and SDAI scores ($P = 0.003$, $P = 0.0002$) significantly improved over this time period. Overall, the study found that 83% (n = 19) of patients displayed an initial response to IXE, whereas 65% (n = 15) had an inadequate response with a median treatment period of 8 months. Reasons for IXE cessation were adverse events and worsening PsO, peripheral arthritis, or axial disease. In conclusion, this study proposes that a class switch between IL-17 inhibitors could be a potential second-line therapeutic option for PsA.

5. *Janne Bolt, MD (Amsterdam, the Netherlands): Senior Principal Investigator: Marleen van de Sande, MD*. Dr. Bolt and team sought a better understanding of the underlying molecular responses to biologic disease-modifying antirheumatic drugs (bDMARDs) to guide further treatment strategies and improve outcomes for PsA. Twenty-two patients with PsA were randomized to receive either adalimumab (ADA) 40 mg/2 weeks or placebo for 4 weeks. Healthy donors (HDs) were used as controls. Nonlesion PsD exhibited significantly lower expression of IL-17A ($P = 0.02$). IL-17F expression was higher in the dermis of lesional psoriatic skin compared to HD skin. IL-17RA and IL-17RC expression was lower in the epidermis of nonlesional PsA skin compared to HD skin, but IL-17RC expression was higher in the dermis of nonlesional PsA skin compared to HD. In conclusion, ADA did not affect protein levels of IL-17A and IL-17F and their receptors in the skin and synovium despite reduced cellular inflammation and improved clinical outcomes for PsD.

6. *Hannah den Braanker, MD, MSc (Rotterdam, the Netherlands); Senior Principal Investigator: Radjesh Bisoendial, MD, PhD*. Dr. den Braanker aimed to understand the molecular progression from local skin inflammation to systemic PsD. Lymphatic endothelial cells (LECs) play a role in homeostasis and inflammatory conditions by regulating transport of T cells and dendritic cells from peripheral tissue to lymph nodes. The study team specifically investigated the role of Notch signaling pathway in LEC-T cell interactions by comparing primary human dermal LECs to primary human dermal fibroblasts from HDs as controls. Expression of interferon-γ, IL-17A, and TNF, and IL-6 were analyzed. In addition, gene transcription of Notch ligands and inhibition of Notch signaling with γ-secretase inhibitor (DAPT) were also evaluated. Memory CD4 T cells, not naïve CD4 T cells, expressed IL-17A, TNF, and interferon-γ. Delta-like ligand 4 (*DLL4*) was upregulated when memory CD4+ T cells were cultured with LECs. However, using DAPT prior to the addition of T cells reduced IL-17A and *DLL4* expression. This study found that blocking the Notch *DLL4* in coculture between human dermal LECs and memory CD4 T cells inhibited IL-17A production, which may represent a novel target to reduce inflammation in PsD.

7. *Hadar Gavra, MD (Haifa, Israel); Senior Principal Investigator: Yonatan Butbul, MD*. Due to the limited validated screening tools available for juvenile PsA (JPsA), Dr. Gavra

aimed to assess the efficacy of 2 screening tools: PEST and EARP. These questionnaires were administered to 39 pediatric patients with clinically diagnosed JPsA. For those screened with PEST, the sensitivity and specificity for diagnosing JPsA were both 100%. For those screened with EARP, the sensitivity and specificity were 100% and 89%, respectively. The authors of this study concluded both the PEST and EARP questionnaires were effective, easy to use, and displayed high sensitivity for diagnosing JPsA in pediatric populations.

8. *Tania Gudu, MD, PhD (Cambridge, UK); Senior Principal Investigator: Deepak Jadon, MBBCh(Hons), MRCP(Rheum), PhD, MHEA*. Dr. Tania Gudu and team aimed to identify unmet needs in the management of patients with PsD. They analyzed the results of a national audit performed by the British Psoriatic Arthritis ConsortTium (BritPACT) on the care of patients with PsA in the UK against the standards of the GRAPPA QUANTUM project. The investigators asked 15 questions to patients on the following topics: referral and diagnosis, assessment and management, multidisciplinary care, patient education, comorbidities, and regular follow-up in patients with PsA. This study found that nearly 98% had access to a form of multidisciplinary care. However, only 31% of patients were referred to patient associations, 18% had access to clinical research studies, and the median time between symptom onset and rheumatology referral was approximately 5 months. Thus, the results of the audit show overall satisfactory management of PsA. The few unmet needs include early referral, assessing certain disease activity domains, and access to research and patient associations.

9. *Fazira Kasiem, MD (Rotterdam, the Netherlands); Senior Principal Investigator: Marijn Vis, MD, PhD*. Dr. Kasiem and team aimed to create a practical guide to easily identify patients with PsA with a high PsO disease burden in daily rheumatology clinical practice. Four hundred thirteen patients from a Dutch southwest Psoriatic Arthritis (DEPAR) cohort were given the Skindex-17 and Dermatology Life Quality Index questionnaires within a 1-week period. Two underlying clusters of questions were identified: psychosocial concerns (n = 20) and physical symptoms (n = 7). In conclusion, Dr. Kasiem proposed a method for rheumatologists to distinguish PsA patients with a high PsO burden from those with a low burden using 2–5 questions focused on psychosocial concerns and physical symptoms.

10. *Mariagrazia Lorenzin, MD, PhD (Padova, Italy); Senior Principal Investigator: Roberta Ramonda, MD, PhD*. Dr. Lorenzin investigated predictors of bDMARD failure and factors associated with failure of multiple (≥ 2) therapies. Two hundred sixty-four patients diagnosed with PsA using the CASPAR criteria who initiated bDMARD therapy from 2004 to 2020 were enrolled in this study. Mean time to first bDMARD discontinuation was 72 months with a 2-year and 5-year retention rate of 75% and 60%, respectively. The primary reasons for switching bDMARDs were inefficacy (n = 79) and adverse events (n = 38). Interestingly, female sex was independently associated with a higher risk of first bDMARD discontinuation, whereas initiating bDMARD therapy before 2015 was found to be a protective factor. In summary, the authors of this study concluded that survival rates were satisfactory for bDMARDs overall.

11. *Florian Lucasson, MD (Paris, France); Senior Principal Investigator: Laure Gossec, MD, PhD*. Dr. Lucasson investigated healthcare disparities for patients with PsO by analyzing the gross domestic product (GDP) per capita across 13 countries in a cross-sectional analysis of an observational study (Remission and Flare in PsA [ReFlaP]). The patients were compared across 3 tertiles of GDP/capita. Of the 439 patients identified, patients from countries with lower GDP/capita were associated with significant disease activity as evidenced by DAPSA > 14, higher swollen joint count, and increased body surface area of PsO. Despite a similar use of bDMARDs across all GDP/capita countries, a higher use of methotrexate was noted in the lowest GDP/capita tertile ($P = 0.04$). In the lower GDP/capita countries, 18.5% of patients scored > 14 on DAPSA, yet were not on any bDMARDs, which is a much higher DAPSA score than in other higher GDP/capita countries. Thus, the authors of this study found that patients who reside in lower GDP/capita countries suffer from higher disease activity and less access to bDMARDs.

12. *Maria Diane Lisboa Tavares Mazzillo, MD (Rio de Janeiro, Brazil); Senior Principal Investigator: Sueli Carneiro, MD, PhD*. Dr. Mazzillo and team assessed the use of the Framingham risk score to evaluate the long-term CVR in patients with PsO. It is known that moderate-to-severe PsO has been associated with increased CV mortality. Dr. Mazzillo performed a cross-sectional study with 3 groups: PsO only (n = 40), PsA only (n = 50), and a healthy control group (n = 40). Of the 85 patients with PsO, 45% had high CVR. High CVR was more prevalent in patients with PsA, and was noted to be 12% greater than the control group and 1% greater than the PsO only group. Considering both groups of psoriatic patients together, patients had a high CVR that was 11% greater than patients in the control group. Although estimating CVR often poses a major challenge, Dr. Mazzillo's study highlights the importance of CVR assessment in patients with PsD.

13. *Celia Michielsens, MD (Nijmegen, the Netherlands); Senior Principal Investigator: Mark Wenink, MD, PhD*. Dr. Michielsens and team evaluated the effect of treat-to-target (T2T) tapering for TNFi on PsA disease activity. One hundred fifty-two patients with PsA who visited clinic between April 2012 and October 2018 had ≥ 6 months of TNFi therapy and ≥ 6 months of at least low disease activity (LDA; defined by physician discretion or Disease Activity Score in 28 joints based on C-reactive protein [DAS28-CRP] < 2.4) were included in this study. Three different time periods were defined: full dose TNFi continuation, TNFi tapering, and stable TNFi dosage after tapering. The primary endpoint was the DAS28-CRP score, whereas the secondary endpoint was the mean percentage of the defined daily dose. The mean DAS28-CRP was 6.5. This study found no significant difference in DAS28-CRP between the 3 time periods. Thus, T2T tapering of TNFi had no negative effects on PsA disease activity compared to full dose discontinuation while reducing drug exposure. Notably, DAS28-CRP may not be the most reliable tool to capture the full disease spectrum of PsA.

14. *Michelle Mulder, MD (Nijmegen, the Netherlands); Senior Principal Investigator: Mark Wenink, MD, PhD*. Dr. Mulder assessed sex differences in disease activity variables and determinants associated with failure to reach treatment targets. This cross-sectional study of 855 patients defined not reaching treatment target goals as a Psoriatic Arthritis Disease Activity Score (PASDAS) of ≤ 3.2 (LDA). Women exhibited higher PASDAS scores with a mean of 3.4 compared to 2.7 in men. In addition, women scored lower than men in measures for swollen and tender joints, CRP, enthesitis, and function (all $P < 0.001$). Women were more often not at PASDAS treatment targets (OR 2.03). In addition, BMI was associated with not reaching LDA (BMI 25–30: OR 3.6, $P < 0.001$; BMI 30–35: OR 2.41, $P = 0.02$; BMI > 35: OR 2.45, $P = 0.002$) in females but not in males. The authors of this study concluded that women may have more severe PsA disease activity than men that may be exacerbated by being overweight.

15. *Vagishwari Murugesan, MD (Massachusetts, USA); Senior Principal Investigator: Maureen Dubreuil, MD*. Dr. Murugesan evaluated hospitalizations for serious infections in patients with PsO from the National Inpatient Sample (NIS) from 2012 to 2017. The infections assessed included pneumonia, sepsis, urinary tract infections (UTIs), and skin and soft tissue infections (SSTIs). The most common infection was found to be sepsis with a mean length of stay of approximately 4 days. Between 2012 and 2017, there was an increase from 50,700 to 179,400 discharge diagnoses of PsA. However, by the end of the study period, there was a significant decrease in incidence of discharges in sepsis ($P < 0.001$), SSTIs ($P < 0.001$), and UTIs ($P < 0.001$). In addition, no statistical difference existed in the trend of pneumonia over the time frame ($P = 0.89$). The main limitation to this study was the lack of available data on outpatient visits or inpatient treatment for the infections. In summary, this study's findings suggest that infection may not pose a significant risk to patients' PsO as biologics become more of a mainstay of psoriatic therapy.

16. *Joseph Nathan, MBChB, MRCP, MRes (London, UK); Senior Principal Investigator: Bruce Kirkham FRCP, PhD*. Dr. Nathan and his team investigated the incidence, presentation, and management of a new clinical paradigm, dupilumab-induced enthesitis/arthritis, in patients with atopic dermatitis (AD). Dr. Nathan conducted a retrospective study of 400 patients with moderate-to-severe AD exhibiting features of enthesitis/arthritis between October 2018 and January 2021. In this cohort, 23 patients had clinical features comprising inflammatory enthesitis, tenosynovitis, and arthritis. Nine patients had both enthesitis and arthritis, 10 had enthesitis only, 3 had enthesitis and tenosynovitis, and 1 had arthritis only. Median onset of symptoms following dupilumab initiation was 4 months. All patients exhibited a satisfactory response to dupilumab with an improvement in Eczema Area and Severity Index score, from 2.1 to 4.2. Thus, Dr. Nathan hypothesized that inhibition of IL-4/IL-13 by dupilumab triggers an IL-17/23/TNF-mediated inflammatory musculoskeletal disease in some patients with AD.

17. *Jacob Pesachov, MD (Haifa, Israel); Senior Principal Investigator: Devy Zisman, MD*. Dr. Pesachov and team assessed the risk of venous thromboembolism (VTE) in patients with PsA using a large health maintenance organization database from 2005 to 2018. In the PsA cohort, 1.2% of patients were diagnosed with VTE, which was significantly higher than in the healthy control group (0.8%; $P = 0.02$). However, the higher prevalence of VTE among patients with PsA was no longer statistically significant in multivariate analysis following adjustments for covariates. Interestingly, diagnosis of VTE in patients with PsA was associated with older age, higher BMI, and increased prevalence of cancer, ischemic heart disease, vascular disease, and prior history of VTE. Thus, the authors concluded that the prevalence of VTE was higher in patients with PsA in comparison to the general population despite no statistically significant difference.

18. *Eleni Pilitsi, MD (Massachusetts, USA); Senior Principal Investigator: Maureen Dubreuil, MD*. Dr. Pilitsi evaluated the national trends for serious infections in patients with PsO between 2012 and 2017 from the NIS, given the increased use of biologic therapies for inflammatory diseases. Patients were identified with discharge diagnoses of pneumonia, sepsis, UTIs, and/or SSTIs. From 2012 to 2017, the number of patients with PsO discharged from hospitals decreased from 50,700 to 21,400. The study team concluded there was a significant decrease in discharges for sepsis, SSTIs, and UTIs ($P < 0.001$), but not for pneumonia ($P = 0.47$). Thus, infections were not found to be a common reason for hospitalization among patients with PsO from 2012 to 2017 despite the increased use of biologics.

19. *Soumajyoti Sarkar, MD (California, USA); Senior Principal Investigator: Siba Raychaudhuri, MD*. Dr. Sarkar and team investigated the natural history of PsA in the male-dominated US veteran population due to the limited available data on PsO in this vulnerable population. Three hundred twenty patients with PsA were enrolled from the Program to Understand Long-term Outcomes in Spondyloarthritis Registry (PULSAR), which is a prospective study for SpA in US veterans. Overall, the predominantly male PsA PULSAR demonstrates similarities to previously published registry studies on the natural history of PsO with respect to age of onset, pattern of joint involvement, and degree of comorbidities; however, this population of US veterans was more racially diverse. In addition, the majority of patients required biologics ($P < 0.01$) with a mean baseline erythrocyte sedimentation rate > 10, suggesting that veterans displayed more advanced PsD.

20. *Jennifer Taylor, MBChB, FRACP (Toronto, Canada); Senior Principal Investigator: Cheryl Rosen, MD, FRCPC*. Given the role of early recognition and diagnosis for successful treatment of PsO, Dr. Taylor and team evaluated the use of the ToPAS II as a diagnostic aid for PsO. The ToPAS II was administered to 258 adult patients recruited from dermatology and family medicine clinics over a 3-year period. Two indices from the questionnaire were used: index 1 with all 5 skin-related questions and index 2 with 3 of the 5 skin-related questions. Both indices demonstrated high specificity (82–92%) and sensitivity (69–84%), and strong negative predictive value (> 95%). To summarize, the ToPAS II appears promising to distinguish patients who have PsO from those who do not. Specifically, questions pertaining to a family

history of PsO, a rash consistent with images of plaque PsO, and a prior diagnosis of PsO by a doctor have high discriminatory value.

21. *Tamara van Hal, MD (Nijmegen, the Netherlands); Senior Principal Investigator: Mark Wenink, MD, PhD*. Dr. van Hal performed a cross-sectional study to assess factors associated with work impairment in patients with PsA in the Netherlands. Patients were treated according to PASDAS. Work impairment was assessed by the Work Productivity and Activity Impairment survey. Out of 246 patients enrolled, over half of the patients had a paid job (52.9%). Among those with a paid job, 10% suffered work impairment and productivity loss. When matched for age and sex, patients with PsA were significantly less likely to hold a paid job (53.5% in PsA group vs 62.6% in control group). However, lower disease activity appeared to protect against work impairment regardless of the psoriatic treatment option. Thus, the authors concluded that adequate disease control may be protective from work impairment.

22. *Daisuke Yamada, MD, PhD (California, USA); Senior Principal Investigator: Samuel Hwang, MD, PhD*. Dr. Yamada and team evaluated a heterozygous gain of function mutation of TRPM4, a calcium-activated nonselective monovalent cation channel, and its role in psoriasiform dermatitis. Previous studies have shown TRPM4 may be involved in the maintenance of skin homeostasis. Keratinocytes derived from het I1029M mice, models with psoriasiform dermatitis, showed greater proportions of G1, S, and G2/M cell cycle stages (18.4%) compared to those derived from wild-type (13.6%) mice. These results demonstrate that TRPM4 may be a key player in keratinocyte proliferation.

Conclusion

The GRAPPA members greatly appreciated the scientific work of the trainees and the interesting discussions that followed. The next GRAPPA trainee symposium will be held in July 2022 in Brooklyn, New York, USA.

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