tumours (396 in males and 342 in females) were diagnosed between 2013 and 2018 in England. This resulted in an ASR of 0.31 per 100 000 person-years for males and 0.19 per 100 000 person-years for females. The trend in ASR for the total population in England was relatively stable from 2013 to 2016, followed by a slight decrease in 2017–2018. The highest overall regional ASR from 2013 to 2018 was found in the east of England (ASR 0.54 per 100 000), followed by London (ASR 0.25 per 100 000). The lowest rate was found in the south west of England (ASR 0.14 per 100 000). Incidence increased with age (median age 82 years, interquartile range 74–88). Ethnicity was unknown in 5% of cases. Of those with known ethnicity, 96% were white. The most commonly affected sites were lower limbs (35.4%), followed by the face (16.0%). This is the largest ever reported series of PC. PC is rare and comparable data are limited. The regional variation identified in our data was unexpected. This may represent discrepancy in confirming a histological diagnosis due to a lack of reliable molecular markers with variable use and interpretation of these. The difference could also be due to data flow artefact, caused by some laboratories being better at sending data than others. Climate and ethnicity differences between the English regions seem unlikely to be sufficient to result in variation of this magnitude. Overall, the data highlight the importance of consistency in use and interpretation of immunohistochemical molecular markers. The regional variation in PC warrants further study in England and elsewhere.

**O10 National Merkel cell carcinoma epidemiology and mortality-related risk factors in England 2004–2018**

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Merkel cell carcinoma (MCC) is a rare neuroendocrine carcinoma with a high mortality. There are few epidemiological studies, particularly at the national level. A 2016 UK regional study suggested a rising incidence of MCC. This retrospective national cohort study identified MCC cases in England from 2004 to 2018 using data from the National Disease Registration Service. Patient demographics and treatments received were described. European age-standardized incidence rates (EASRs) and jointpoint trend analysis were conducted. Multi-variable Cox regression analysis was used to study risk factors for MCC-specific mortality by including a priori defined demographic characteristics, tumour location and immunosuppression (haematological malignancy, HIV or transplant recipient). In total, 3775 patients were diagnosed with MCC between 2004 and 2018. Median age at diagnosis was 81 (interquartile range 74–87). Ninety-seven per cent of patients identified as white. There was an even distribution across deprivation quintiles. Eight per cent of patients were immunosuppressed. The most common site was the face (27.4%). Patient’s most often presented with stage 1 disease (22.8%); however, stage was unknown in 31.0%. Eighty-one per cent of patients underwent excision, 43.3% received radiotherapy and 9.2% received chemotherapy. The crude MCC count rose from 177 in 2004 to 336 in 2018. The EASR increased from 0.43 [95% confidence interval (CI) 0.37–0.50] per 100 000 person-years (PYs) to 0.65 (95% CI 0.58–0.72) per 100 000 PYs between 2004 and 2018. This represented an annual percentage change of 3.9% (95% CI 2.92–5.01). The EASR was greater in males than females for all years with an overall male to female ratio of 1.41 : 1. The highest EASR was in south west England and lowest in London. MCC-specific mortality increased with age [hazard ratio (HR) 1.02, 95% CI 1.02–1.03], deprivation (HR 1.43, 95% CI 1.16–1.76), immunosuppression (HR 2.80, 95% CI 2.34–3.34) and stage at diagnosis (HR 8.24, 95% CI 5.84–11.61). Low ultraviolet radiation (UVR)-exposed sites [ears (females only), scalp/neck (females only) and the trunk] had a higher mortality than high-UVR exposed sites [lips, eyelid, ear (males only), face, scalp/neck (males only), upper limb, lower limb] (HR 1.71, 95% CI 1.44–2.04). This study reported the largest and most complete dataset for MCC national incidence and survival ever published: 3775 patients over 15 years. Stage at presentation, followed by immunosuppression were the strongest predictors of MCC-specific mortality. High-UVR-exposed sites had a lower mortality than low-UVR sites, possibly related to early recognition but requiring further investigation. With the EASR of MCC increasing, it is important to identify who should receive adjuvant therapies and closer clinical follow-up.

**Registrar papers**

**RF01**

Abstract withdrawn.

**RF02**

Hospitalization from COVID-19 is most frequently observed in patients with atopic dermatitis treated with systemic corticosteroids, and in particular when systemic corticosteroids are used in combination with another immunomodulatory treatment: lessons from the global SECURE-AD registry

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Cutaneous and systemic infections are more common in patients with atopic dermatitis (AD) than the general population. Patients with inflammatory skin disease, including AD, may also have a higher risk of COVID-19, even after adjustment for COVID-19 risk factors. Furthermore, systemic immunomodulatory treatments used for AD may alter the risk of severe COVID-19, including hospitalization, ventilation and/or death. With different mechanisms of action, and varying levels of immunosuppression, it is not clear which therapies for AD carry the highest and lowest risk of severe COVID-19, and strong evidence to support clinical decision-making is currently lacking. The Surveillance Epidemiology of Corona Virus Under Research Exclusion for Atopic Dermatitis (SECURE-AD) registry was developed to investigate COVID-19 outcomes in patients with AD, in particular patients receiving systemic immunomodulatory treatments. Using an international online registry, clinicians from 27 countries reported 442 patients with AD and suspected or laboratory-confirmed COVID-19. Demographics and COVID-19 outcomes were summarized using descriptive statistics. A multivariate logistic regression model was fitted to explore the odds of hospitalization in patients treated with a single systemic immunomodulatory treatment, or with topical treatments alone. A second regression analysis explored the effects of systemic treatments used in combination vs. single-agent nonsteroidal immunomodulatory therapies. Regression models were adjusted for age, sex, ethnicity and comorbidities. Among 442 patients, 26 patients were hospitalized (5.9%). Intensive care unit admission and/or ventilation was uncommon (n = 10), and no deaths were reported in the registry. Patients using only topical treatments had significantly higher rates of hospitalization than patients receiving dupilumab [adjusted odds ratio (aOR) 4.95, 95% confidence interval (CI) 1.39–20.77]. Compared with dupilumab, patients receiving systemic corticosteroids or other conventional systemic treatments also had higher rates of hospitalization [aOR 2.81 (95% CI 0.08–37.85) and aOR 2.36 (95% CI 0.11–9.47), respectively]; however, these associations were not statistically significant. Compared with single-agent nonsteroidal immunomodulatory treatments, hospitalization was significantly more likely in patients receiving systemic corticosteroids in combination with another systemic therapy (aOR 45.57, 95% CI 4.54–616.22), and in patients receiving a combination of nonsteroidal immunomodulatory therapies (aOR 37.57, 95% CI 1.05–871.11), including after adjustment for confounding variables. This global registry reinforces the known safety profile of dupilumab and highlights important differences in the risk of severe COVID-19 among various treatments for AD. Clinicians should consider the risks and benefits before prescribing systemic therapies in combination, in particular when combination therapy includes systemic corticosteroids.

**Rf03**

**Risk factors for paradoxical eczema in patients with psoriasis on biologics: a nested case–control study**

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Psoriasis and atopic eczema rarely occur together, but the treatment of psoriasis with biologics can cause paradoxical eczema (PE). This can be challenging to treat and result in treatment discontinuation. The objective of our study was to summarize the clinical features of PE and to identify risk factors for its occurrence. Data were obtained from the British Association of Dermatologists Biologics and Immunomodulators Register (BADBIR) from its inception in 2007 to March 2021. All participants received biological therapy for chronic plaque psoriasis. Cases had recorded PE events; controls did not. PE was defined as eczema occurring after biological exposure, diagnosed as atopic by the clinician or on review of registry adverse event records by two researchers. Data were analysed with descriptive statistics and using multivariable logistic regression models with presence or absence of PE as the outcome variable. There were 192 individual patients with 204 PE events, and 13 103 controls. Fifty-seven per cent (n = 110) of cases were female vs. 41% (n = 5363) of controls. Most participants in both cohorts were white (90%), with small numbers from other ethnicities. Psoriatic arthritis (PsA) was present in 35% of cases and 26% of controls. The median time to onset from biological initiation was 263 days (interquartile range 91–550), with no significant difference between biological classes (P = 0.21). The proportion of biological exposures resulting in PE by drug class were as follows: anti-tumour necrosis factor (TNF); 0.8%; anti-interleukin (IL)-17; 0.9%; ustekinumab, 1.1%; anti-IL-23p19, 0.6%. The distribution of eczema was variable, with commonly affected sites including the face (26%), trunk (14%), limbs (33%) and flexures (11%). In those with reported treatments (n = 125), modalities included topical therapies (80%), oral immunomodulators such as ciclosporin (11%) and pausing/stopping biological therapy (16%). Of the cases, 21% had a prior history of atopy (atopic eczema, asthma or hay fever) vs. 11% of controls. The first regression model found associations between PE and prior atopy [adjusted odds ratio (aOR) 2.10, 95% confidence interval (CI) 1.49–2.97], age (1.02 per...