Published Research -SQCCCRC

Gynecological Cancers Program (2022)

1. Kumar S, **Burney IA,** Kunju J, Al Marhoon MS, Siddiqui KM. Clinicopathological features, treatment and outcomes of Omani patients with metastatic prostate cancer. Oman Med J. 2022. DOI 10.5001/omj.2021.117.

   Results: In this retrospective analysis on patients diagnosed to have metastatic prostate cancer at a single institution in Oman, we demonstrated that the median age was 71 (range = 57–92) years. The majority of patients (61.3%) had a Gleason score ≥ 8. Median prostate-specific antigen (PSA) level was more than 100.0. Bone was the most common site of metastatic disease (90.3%). After a median follow-up of 34.5 months, the median PFS was 17 months, while the median OS was 43 months. Median survival post mCRPC was 17 months.

   Omani patients with mPCa present with high PSA and Gleason score and with widespread metastatic disease burden. Treatments offered are according to internationally accepted standards and have comparable PFS and OS as reported elsewhere.

2. Jayakrishnan, Al Moundhri, M, **Burney** I, Al Hashmi Z, Al Bimani K. Pulmonary toxicities of immune checkpoint inhibitors in the management of cancer: mini review. Adv Respir Med. 2022; 90: 219-229.

   This mini-review was aimed to report immune related adverse events, especially, immune related pneumonitis, secondary to immune checkpoint inhibitor therapy. Though the reported numbers may seem clinically trivial at this point, the actual number in real-world populations may be high and definitely will increase as the therapeutic indications for ICIs continue to expand to include other malignancies. However, a risk assessment method for ICI induced pneumonitis has not been established and the prediction of pneumonitis occurrence is difficult. Presently, clinical vigilance, prompt detection, close monitoring and early intervention are key factors in management.

3. Al Sabei SD, Al Rawajfah O, AbualRub R, Labrague LJ, **Burney IA.** Nurses' job burnout and its association with work environment, empowerment and psychological stress during COVID-19 pandemic. Int J Nurs Practice. 2022: 1-10. DOI: 10.1111/ijn.1307.

In this cross-sectional study, we demonstrated that about two-thirds of nurses (65.6%) working at the time of COVID-19 pandemic in Oman reported high levels of job burnout, using the Maslach Burnout Inventory. Furthermore, Nurse manager's ability, leadership and support; staffing and resources adequacy; and nurses' access to support were significant factors associated with a reduced level of burnout.

Supporting nurses during the crisis, ensuring adequate staffing levels and providing sufficient resources are critical to lower job burnout. Creating a positive and empowered work environment is vital to enhance nurses' retention during the pandemic.

4. **Burney IA, Al Sharbati ZM,** Al Rawahi Z, Al Hatmi S, Rizvi SG, Boulassel MR. A Comparison of Two Scales to Determine Prevalence of Mood Disorders in Omani Patients Recently Diagnosed with Cancer. Asia Pac J Can Prev 2022; 23(7):2367-2373. DOI: 10.31557/APJCP.2022.23.7.2367.

   In this cross-sectional study on patients diagnosed to have cancer within the three months of assessment, the prevalence of anxiety and depression was 41.6%, 28.1% respectively. There were no significant relationships between factors such as, age, gender, employment status, financial status, educational level, marital status, co-morbid diseases and either depression or anxiety. Anxiety was more common amongst patients with breast cancer (27%) and depression was more prevalent amongst patients with colon cancer (28%). Almost 1/3rd of the patients receiving chemotherapy were had symptoms of anxiety. There was a significant association between anxiety and depression symptoms (P<0.0005). The two scales (HADS and CES-D) closely correlated in identifying patients with depression. (r^2=0.358; P<0.0005).

   The prevalence of depression in newly diagnosed patients in Oman was 28%. There were no correlation between socio-demographic factors and depressive and anxiety symptoms; therefore all patients must be screened. However, since there is a significant association between depressive and anxiety symptoms, hence patients who have anxiety must be checked for the presence of depression.

5. Al Balushi N, Hassan SI, Abdullah N, Al Dhahli B, Al Bahlani S, Ahmed I, Tsang BK, Dobretsov S, Tamimi Y, **Burney IA.** Addition of Gallic Acid Overcomes Resistance to Cisplatin in Ovarian Cancer Cell Lines. Asia Pac J Can Prev. 2022; 23(8): 2661-2669.

   Gallic acid is a polyphenolic compound commonly found in many plants. Gallic acid has been reported to have anticancer activity against lung cancer, breast cancer, prostate cancer, leukaemia, and cervical cancer. We tested to see if GA

would be cytotoxic against ovarian cancer cell lines as well, and whether it would help to overcome the resistance to cisplatin. GA decreased cell viability in a concentration-dependent manner in all cell lines, with an IC50 of 19.39µg/mL (A2780S), 35.59 µg/ mL (A2780CP), and 49.32µg/mL (HOSE6-3). GA displayed higher cytotoxicity than its congeners. An apoptotic rate estimation of approximately 20% and 30% was obtained in A2780S and A2780CP. While the cytotoxicity observed with cisplatin and GA was comparable, combining the two enhanced the cytotoxicity significantly, especially in the A2780CP cell line ($p<0.05$)

The data suggest that GA may help overcome the resistance. Hence, the cytotoxic effects of GA, especially on chemo-resistant ovarian cancer cells merit further investigation.

6. **Burney IA,** Al Sabei S, Al Rawajfah O, Labrague LJ, AbualRub R. Determinants of Physicians' Job Satisfaction: A national multi-center study from the Sultanate of Oman. SQUMJ. 2022; https://doi.org/10.18295/squmj.8.2022.050.

   In this cross sectional study we reported that there was a high level of job satisfaction amongst physicians in Oman. There was no difference in the mean job satisfaction score among different groups of study participants, except for gender and the working grade ($P<0.05$). The overall job satisfaction rates were higher for the quality of care (mean = 3.93 ± 0.61) and ease of practice (mean = 3.89 ± 0.55) and lower for relationship with leadership (mean = 3.67 ± 0.86). Having a clinical postgraduate degree together with a PhD, a senior level of responsibility and good inter-professional relationship were associated with higher job satisfaction rates ($P = 0.003$ and 0.007, respectively).

   Overall, the job satisfaction rate was high. There was no difference among different groups of study participants, except for the working grade. Having a clinical postgraduate degree, a senior level of responsibility and good inter-professional relationship were associated with higher job satisfaction rates. The overall job satisfaction rates were higher for the quality of care and for ease of practice and lower for relationship with the leadership. Relationship with leadership is a modifiable factor and efforts at enhancing the physician–leadership relationship may lead to even higher satisfaction rates

7. **Burney IA,** Ahmad N. Artificial Intelligence in Medical Education: A citation-based systematic literature review. JSTMU. 2022; 5(1).

   This review of literature aimed to describe the existing and emerging role of Artificial intelligence (AI) in medical education, as this may help set future directions. Published articles on AI in medical education describing integration of

AI or machine-learning (ML) in undergraduate medical curricula or structured postgraduate residency programs were extracted from SCOPUS database using PRISMA) research methodology. Of the 1020 documents published till October 15, 2020, 218 articles are included in the final analysis. A sharp increase in the number of published articles was observed 2018 onwards. Articles describing surgical skills training, case-based reasoning, physicians' role in the evolving scenario, and the attitudes of medical students towards AI in radiology were cited frequently. Of the 50 top-cited papers, 16 (32%) were 'commentary' articles, 13 (26%) review articles, 13 (26%) articles correlated usefulness of ML and AI with human performance, whereas 8 (16%) assessed the perceptions of students toward the integration of AI in medical practice.

AI should be taught in medical curricula to prepare doctors for tomorrow, and at the same time, could be used for teaching, assessment, and providing feedback in various disciplines.

8. Raza SA, **Burney IA,** Pervez N, Ahmed M. A bibliometric analysis of use of machine leaning and artificial intelligence in prostate cancer detection. Authorea. Dec 5, 2022. DOI: 10.22541/au.167026739.93526972/v1.

In this bibliometric analysis, we reported that Artificial Intelligence (AI) and Machine learning (ML) tools are progressively being used to improve the diagnostic accuracy of prostate cancer. We interrogated the existing published literature to review the use of AI and ML in the diagnosis of prostate cancer. The two most consistent themes are predictive modeling and application areas of the AI/ ML tools, especially for cancer grading and radiomics. AI and ML are gradually being implemented to enhance the diagnostic accuracy by reducing the inter-individual variabilities in the Gleason's scoring system (low grade from the high grade prostate cancer), and complimenting the use of multiparametric magnetic resonance imaging (mpMRI). As of recently, there has been an exponential growth in the number of published papers. A few publications reported the use of AI/ML tools by combining histopathology and MRI signals.

AI and ML have the potential to use a combination of demographic features, clinical data, serological markers, pathological grading and radiological factors, and genomic data, to propose accurate non-invasive diagnosis of clinically significant prostate cancer.

9. Malgundkar SH, Hassan NA, Al Badi H, Gupta I, **Burney IA**, Al Hashami Z, Al Barwani H, Al Riyami H, **Al Kalbani M,** Lakhtakia R, Okamoto A, Tamimi Y. Identification and validation of a novel long non-coding RNA (LINC01465) in ovarian cancer. Human Cell. Dec 2022. http://dx.doi.org/10.1007/s13577-022-00842-x.

Epithelial Ovarian Cancer (EOC) is a heterogeneous disease usually diagnosed at advanced stages. Therefore, early detection is crucial for better survival. Despite the advances in ovarian research, mechanisms underlying EOC carcinogenesis are not elucidated. We performed chromatin immunoprecipitation sequencing to identify genes regulated by E2F5, a transcription factor involved in ovarian carcinogenesis. Results revealed several putative candidate genes (115 protein-coding genes, 20 lncRNAs, 6 pseudogenes, and 4 miRNAs). A literature review and bioinformatics analysis of these genes revealed a novel lncRNA candidate (LINC01465) in EOC. We validated LINC01465 by quantifying its expression in EOC cell lines and selected OVSAHO and SKOV3 as a model with high LINC01465 levels. We silenced LINC01465 and performed proliferation, wound healing, invasion, and drug resistance assays. Knocking-down LINC01465 resulted in reduced migration, suggesting potential involvement in EOC. Furthermore, to identify the significance of LINC01465 in chemoresistance, we assessed the LINC01465 levels in A2780 S cells treated with malformin, which revealed higher LINC01465 expression as compared to untreated A2780S cells implying the involvement of LINC01465 in cell death.

This study unraveled the repertoire of E2F5 regulated candidate genes and suggested a putative role of LINC01465 in malformin-induced cell death in EOC.