LETTER TO THE EDITOR

Cancers in Arab populations: concise notes

Sir,

Rapid improvements in the field of health care and dramatic socioeconomic changes resulting in modified lifestyles are believed to have contributed to the increased incidence of cancers in Arab populations.[1] For example, the UAE is experiencing a continually increasing proportion of cancer burden, imposing itself as the third leading cause of death after cardiovascular diseases and accidents.[2] Very preliminary data from the CTGA (Catalogue for Transmission Genetics in Arabs) database for genetic disorders in Arab populations indicate the presence of at least 55 cancer types in Arab people (Table 1). Although these types of cancers vary with regard to their incidence and frequency, strong indicators show clearly that cancers of the lung and prostate are the most common among males whereas breast and thyroid cancers are the most common among females in the region (reviewed in reference 4).

Cancer is not typically regarded as a population-specific disorder. However, several aspects of cancer differ by race and ethnicity. Among Arabs, several types of cancers show many distinct features that are quite different from those seen in other populations worldwide.

Breast cancer is ranked as the most common cancer among Arab women. In spite of this, up until a few years ago, this disease was considered to be much rarer among Arabs than in other global populations. This low incidence was ascribed to the prevalence of sociocultural factors that protected against the development of breast cancer. However, more recent studies have shown a higher incidence of this disease in Bahrain, Kuwait and Qatar.[5] Incidentally, these countries have also been characterized in recent years by lower fertility rates, rapid decline in child-bearing age and a lower duration of breast feeding. Another characteristic of breast cancer in Arab women concerns the mean age at onset of this disease, which is at least a decade earlier than in women of other ethnicities.[6] To complicate matters, many of the social customs followed in Arab populations result in delayed patient presentation to the physician.

Prostate cancer lies at the other end of the spectrum. The incidence of clinical prostate cancer in Arabs is among the lowest in the world. This is despite the increased prevalence of risk factors, including the intake of high-caloric food rich in animal fat.[7] Interestingly, mean serum prostate-specific antigen (PSA) levels are also known to be low in Arab men. In fact, several studies have pointed towards the necessity of establishing Arab-specific serum PSA reference levels for early diagnosis of prostate cancer.[8]

Despite the fact that heredity plays little part in the aetiology of most cancer types, studies of the molecular genetics of cancers are becoming invaluable tools to provide insights into the pathways leading to individual tumours and to create opportunities to develop modern clinical applications based on cancer genomics. The two examples illustrated above point to the need to conduct such types of studies in the region because of the possible involvement of specific genetic factors in Arab populations that create many cancers with unique genetic signatures while others seem to exhibit characteristics of strict familial inheritance. Interestingly, the case of multiple endocrine neoplasia type 2A, described in an extended family in Qatar, illustrates this perspective. Following the assignment of the RET proto-oncogene p.C634G mutation leading to the disease in the propositus and in 21 other family members, those individuals with the mutation were further assessed for phaeochromocytoma and, in some, adrenalectomy was performed. Similarly, family members who had the mutation and presented with hyperparathyroidism underwent total thyroidectomy and central compartment dissection.[9]

Undoubtedly, the Qatari study is a good example of how combined phenotype–genotype knowledge of the disease in a high-risk group is a critical component for proper diagnosis and health care delivery. The application of such procedures is difficult to imagine in the region in the near future owing

TABLE 1 An alphabetical list of cancer types and corresponding molecular genetic studies to depict the aetiologies of some of these cancers in Arabs according to the CTGA database[3]

Cancer	Molecular genetic study
Basal cell carcinoma, multiple	–
Basal cell naevus syndrome	–
Becker naevus syndrome	–
Bladder cancer	–
Branchial cleft anomalies	–
Breast cancer	Mutations in HSPA2, IL1B, LEP, LEPR, and TNF genes
Burkitt's lymphoma	–
Carcinoid tumours, intestinal	–
Cervical cancer	–
Colorectal cancer	Genome-wide scanning
Cylindromatosis, familial	–
Dermatofibrosarcoma protuberans	–
Ependymoma, familial	–
Oesophageal cancer	–
Ewing's sarcoma breakpoint region 1	–
Gastric cancer	–
Glioma of brain, familial	–
Haemangioma, capillary infantile	–
Haemangiopericytoma, malignant	–
Hodgkin's lymphoma	–
Kaposi's sarcoma	–
Leiomyoma, hereditary multiple, of skin	–
Leiomyoma, uterine	Cytogenetic study
Leukaemia, acute lymphoblastic	BCR-ABL1 and MLL-AF4 fusion genes
Leukaemia, acute myeloid	Cytogenetic study
Leukaemia, chronic lymphocytic	–
Leukaemia, chronic myeloid	Cytogenetic study
Lung cancer	–
Lymphoma, non-Hodgkin's, familial	–
Lynch syndrome I	–
Macroglobulinaemia, Waldenström's, susceptibility to, 1	–
Medulloblastoma	–
Melanoma, cutaneous malignant	–
Mesothelioma, malignant	–
Mismatch repair cancer syndrome	–
Multiple endocrine neoplasia, type IIA	Mutation in RET gene
Myeloma, multiple	–
Nasopharyngeal carcinoma	–
Neuroblastoma	–
Nuchal bleb, familial	–
Pancreatic carcinoma	–
Papilloma of choroid plexus	–
Prostate Cancer	–
Renal cell carcinoma, papillary	–
Renal hamartomas, nephroblastomatosis, and fetal gigantism	–
Retinoblastoma	Mutation in RB1 gene

TABLE 1 Continued

Cancer	Molecular genetic study
Rhabdomyosarcoma 1	–
Squamous cell carcinoma, head and neck	Genome-wide scanning
Testicular tumours	–
Thymoma, familial	–
Thyroid carcinoma, follicular	–
Thyroid carcinoma, papillary	–
Trichoepithelioma, multiple familial, 1	–
Vascular malformation, primary intraosseous	–
Wilms' tumour 1	–

to the dearth of research activities and published literature on the molecular genetic predisposition of many cancer types among Arabs (Table 1). This problem is further accentuated by the incapacity of public awareness and national strategies to reach the threshold level to result in a positive communal engagement and to actively control cancers at early stages (reviewed in reference 3). On the bright side, however, ordinary or uneducated people in the region have a far more philosophical approach to life and death than do many Westerners and also understand without difficulty the concept of cancer, the need to carry out complicated tests to reach diagnosis and the outline of treatment. This attitude enables most people in the region to accept diagnosis and treatment of cancer with less anxiety, especially as many of the cancers that were formerly considered universally fatal are now entirely curable.[10]

References

1 Al-Hamdan N, Ravichandran K, Al-Sayyad J, *et al*. Incidence of cancer in Gulf Cooperation Council countries, 1998-2001. *East Mediterr Health J* 2009; 15:600–11.
2 UAE Ministry of Health. *Cancer Incidence Report: UAE (1998–2002)*. Abu Dhabi, 2002.
3 Tadmouri GO, Al Ali MT, Al-Haj Ali S, Al Khaja N. CTGA: the database for genetic disorders in Arab populations. *Nucleic Acids Res* 2006; 34(Database issue):D602–6. http://dx.doi.org/10.1093/nar/gkj015
4 Tadmouri GO, Al-Sharhan M, Obeid T, Al-Ali MT. United Arab Emirates. In: Tuncer AM (ed.), *Asian Pacific Organization for Cancer Prevention: Cancer Report 2010*. New Hope in Health Foundation, Ankara, 2010.
5 Ravichandran K, Al-Zahrani AS. Association of reproductive factors with the incidence of breast cancer in Gulf Cooperation Council countries. *East Mediterr Health J* 2009; 15:612–21.
6 Ayad E, Francis I, Peston D, Shousha S. Triple negative, basal cell type and EGFR positive invasive breast carcinoma in Kuwaiti and British patients. *Breast J* 2009; 15:109–11. http://dx.doi.org/10.1111/j.1524-4741.2008.00682.x
7 Ghafoor M, Schuyten R, Bener A. Epidemiology of prostate cancer in United Arab Emirates. *Med J Malaysia* 2003; 58:712–16.
8 Anim JT, Kehinde EO, Sheikh MA, Prasad A, Mojiminiyi OA, Ali Y, Al-Awadi KA. Serum prostate-specific antigen levels in Middle Eastern men with subclinical prostatitis. *Med Princ Pract* 2007; 16:53–8. http://dx.doi.org/10.1159/000096141
9 Zirie M, Mohammed I, El-Emadi M, Haider A. Multiple endocrine neoplasia type IIA: report of a family with a study of three generations in Qatar. *Endocr Pract* 2001; 7:19–27.
10 Bener A, Honein G, Carter AO, Da'ar Z, Miller C, Dunn EV. The determinants of breast cancer screening behavior: a focus group study of women in the United Arab Emirates. *Oncol Nurs Forum* 2002; 29:E91–8. http://dx.doi.org/10.1188/02.ONF.E91-E98

Ghazi Omar Tadmouri and Pratibha Nair
Centre for Arab Genomic Studies
PO Box 22252, Dubai, United Arab Emirates
Email: cags@emirates.net.ae