Letter to Editor

Biomarkers in uterine leiomyomas and their clinical significance

Leiomyomas are the most common benign smooth muscle uterine neoplasm of the reproductive age group.^[1] They are steroid-dependent tumors. Leiomyomas are diagnosed by clinical examination, ultrasonography, and histopathology examination of hysterectomy specimens or excised myomas.^[2] Biomarkers are biological compounds that can be obtained from serum or other easily accessible tissues. They are the reflection of physiology or pathology.^[3] Biomarkers which are raised in leiomyoma are prolactin, serum total protein, S. HLA-G, VEGF, Ghrelin, lactate dehydrogense A, hypermethylated death-associated protein kinase, CA-125, hematopoietic growth factors, human epididymis protein 4, proteomics, and gonadal hormones.

Prolactin is a protein hormone involved in various mammalian physiologic actions such as lactogenesis. It is also expressed in other tissues including uterine leiomyomas.^[4] It is raised in uterine leiomyomas.

Serum protein is lower in patients with leiomyoma probably because these patients are predisposed to abnormal uterine bleed and menorrhagia.^[2]

S human leukocyte antigen G (HLA-G) is an antigen of the immune system which is also expressed in uterus. It is elevated in melanoma, ovarian, and breast carcinoma. Basta *et al.*^[5] demonstrated higher levels of HLA-G in patients with leiomyoma.

Vascular endothelial growth factor (VEGF) and hematopoietic growth factor – VEGF is an angiogenic peptide for the growth of tumors. Chen *et al.*^[6] evaluated raised serum VEGF in women with uterine leiomyoma. Similarly, hematopoietic growth factor, such as macrophage colony stimulating factor (M-CSF) and granulocyte colony stimulating (G-CSF), are raised in endometrial carcinomas and leiomyomas.

Ghrelin – It is secreted by the stomach. Markowska^[7] found raised levels of ghrelin in women with leiomyoma.

Lactate dehydrogenase A – It is involved in anerobic glycolysis, and its levels are raised in ovarian cancers and leiomyoma. [8]

CA-125 is raised in ovarian carcinoma as well as in patients with endometrial carcinoma and other benign gynecological diseases such as endometriosis, pelvic inflammatory diseases, adenomyosis, and uterine leiomyomas.^[9]

Growth hormones – leiomyomas need hormonal milieu for their growth and maintenance as evident by molecular studies that leiomyoma exhibits more estrogen receptors than normal myometrium.^[2]

Conclusion

Biomarkers in leiomyoma are useful for diagnosis as well as for prognosis. There are a number of markers that are raised in leiomyoma uteri, however, ideally it should be sensitive, specific, and cost effective.

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Conflicts of interest

There are no conflicts of interest.

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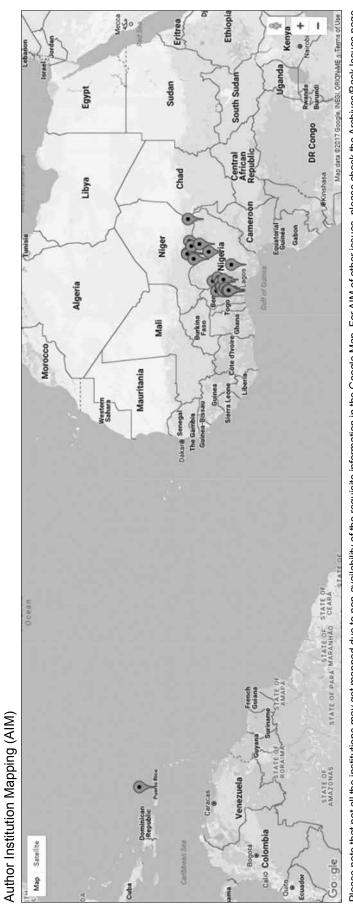
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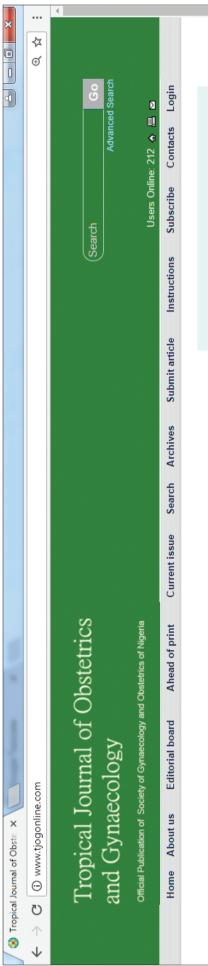
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