of working age in Gwagwalada. There is almost equal gender distribution and majority of subjects had at least secondary education with good prospects for patient education and treatment compliance. Igbo and Yoruba ethnic groups were more represented in the POAG group. This probably corroborates the reported high prevalence of POAG among Igbo and Yoruba.[1] Also, the two ethnic groups might have had better eye health care awareness and/or economic capability for uptake of eye care services.

Many patients admitted POAG positive family history agreeing with previous reports.[2] Management of glaucoma is incomplete until family members are screened, as an individual with family history has about 9% chance of developing glaucoma.[3-6] Furthermore, some participants had diabetes mellitus and hypertension, comorbidities which could aggravate POAG[5] if not appropriately controlled. Majority of POAG patients were on antiglaucoma drugs, mostly combination drugs, and few had undergone glaucoma surgery. It is of concern that not all POAG were on treatment. The challenges of glaucoma management include inability of some patients to afford and sustain glaucoma treatment expenses.[7,8]

In conclusion, POAG was significantly associated with visual impairment (including blindness), high cup-disc ratio and high intraocular pressure. POAG has distinguishing sociodemographic and clinical features. Igbo and Yoruba were the predominant ethnic groups especially in the glaucoma population.

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Survey of eye patients' serum for possible biomarkers of primary open angle glaucoma in Gwagwalada, Nigeria

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Background: The burden of primary open angle glaucoma (POAG) continues to be a significant public health concern. Although a lot of improvements have been achieved in glaucoma care with the development of sophisticated automated perimetry[1] and imaging studies[2] they are not readily available in many glaucoma clinics in resource-limited settings. The potential discovery of biomarkers for POAG holds promise of further improvement in its diagnosis and management. This study compared serum parameters of POAG with non-glaucoma eye patients (NGEP) with the aim of identifying possible biomarkers for POAG.

Methods: The fasting serum samples of 235 adult participants including 96 POAG patients and 139 NGEP were collected and analysed for urea, creatinine, electrolytes, enzymes, protein, bilirubin and lipids.

Results: The mean age was 49.88±13.75 years and 114 (48.5%) were males. The mean values of some serum parameters in the POAG group compared with NGEP were as follows: urea (POAG-37.04mg/dL versus NGEP-27.01mg/dL, p<0.001); chloride (POAG- 86.47mmol/L versus NGEP-78.63mmol/L p=0.017); creatinine (POAG- 1.08 mg/dL versus NGEP- 1.68 mg/dL, p=0.007); Alkaline phosphatase (POAG-17.47U/L versus NGEP- 93.09U/L, p<0.001); Alanine transaminase (POAG- 3.33U/L versus NGEP- 14.95U/L, p<0.001); Aspartate transaminase (POAG-16.90U/L versus NGEP- 21.37U/L, p=0.258); total protein (POAG- 5.60g/dL versus NGEP- 6.03g/dL, =0.015); globulin (POAG-2.34g/dL versus NGEP-2.75g/dL, p=0.020). There were no significant differences in the mean values of serum sodium, potassium, albumin,total bilirubin, direct bilirubin, cholesterol and triglyceride.

Discussion: The study determined and compared the mean values of serum urea, creatinine, electrolytes, enzymes, protein, bilirubin, and lipids of 96 POAG and 139 non-glaucoma eye patients.POAG was significantly associated with higher serum urea and lower serum creatinine. A Nigerian study also found significant difference between serum creatinine however, the mean creatinine was higher in POAG than non-glaucoma, unlike in this study.[3]

The mean serum chloride in POAG was significantly higher, while serum sodium and potassium in POAG were not significantly different from those of NGEP. In a Nigerian study the mean aqueous humour chloride and bicarbonate in glaucoma were significantly higher when compared with cataract and control groups.[4]

The mean serum Alkaline phosphatase and Alanine transaminase in POAG were significantly lower when compared with NGEP while the mean serum values for Aspartate transaminase as well as total and direct bilirubin were similar between the groups. This is in contrast to the findings of Shao *et al.*[5]who reported that patients with POAG had higher total bilirubin, which was significantly positively correlated with POAG severity in male patients, but not in female patients.

The mean serum total protein and globulin were significantly lower in POAG, but the mean serum albumin in POAG was not significantly different from NGEP. A previous study reported that both mean total protein and albumin were lower in POAG than controls but only albumin was significantly different.[3]

The mean serum cholesterol and triglyceride were not significantly different between the 2 groups. On the contrary, Dube *et al*.[6] found total cholesterol to be significantly higher in POAG, while Pertl and others[7] reported that triglyceride was significantly higher in POAG. Other studies[8,9] could not confirm any association, while yet another report[10] found a significant inverse relationship between high triglyceride levels and glaucoma.

In conclusion, serum urea, creatinine, chloride, Alkaline phosphatase, Alanine transaminase, total protein and globulin were associated with the POAG. The need to validate these associations between serum parameters and POAG by conducting studies with larger sample size is underscored.

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Survey of eye patients' urine for possible biomarkers of primary open angle glaucoma in Gwagwalada, Nigeria

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Background: Primary open angle glaucoma (POAG) remains a major cause of blindness and visual impairment. Options for its investigation are expanding, though some are not clinically practical. Many bio-products are excreted in the urine especially water, chemicals, electrolytes, nitrogenous chemicals (urea, creatinine), vitamins,