

RELEVANCE OF ROUTINE PREOPERATIVE LABORATORY TESTS BEFORE CATARACT AND GLAUCOMA SURGERY IN A NIGERIAN TEACHING HOSPITAL

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SUMMARY

Objective: To investigate the outcome and the relevance of routine laboratory tests, i.e., full blood count (FBC), packed cell volume (PCV), haemoglobin (Hb), and fasting blood sugar (FBS) before cataract and glaucoma surgery.

Materials and Methods: A retrospective review of records of all patients who had cataract/glaucoma surgery at University of Ilorin Teaching Hospital (UIITH) over a one and a half year period (October 2002 - March 2004) was carried out. Data assessed include age, sex, type of surgery done, laboratory tests done and the results.

Results: The records of 250 patients who were operated on at the University of Ilorin Teaching Hospital (UIITH) during the period under study were reviewed. The age range was between 1 and 90 years, with a mean age of 56.54 years $SD \pm 19$. The male to female ratio was 1.2:1. The majority of the patients (94.0%) had normal (2-6mmol/L) fasting blood sugar, while 6.0% had high FBS (> 6 mmol/L). The mean FBS was 3.49 $SD \pm 1.87$. Out of the 186 patients whose PCV records were available for review, 178 (71.2%) had normal PCV $< 30\%$ and 4.3% had low PCV of $< 30\%$. The mean PCV was 28.12 $SD \pm 17.1$.

Conclusion: Routine laboratory tests before cataract and glaucoma surgery are not advised since a significant number of the patients had normal FBC and FBS. Therefore, indiscriminate preoperative routine testing should be avoided while more attention should be paid to history and clinical examination, the specific procedure being performed and the type of anaesthesia to be used.

Key words: cataract, glaucoma, surgery, laboratory tests, eye centres

INTRODUCTION

Cataract surgery and trabeculectomy are the two most common types of surgery performed by ophthalmologists.¹ They have been proven to be very safe and very effective in improving the quality of life of patients with cataract and glaucoma.² These procedures are usually carried out under local anaesthesia and even as day cases in selected patients.^{3,4,5}

Usually, patients scheduled for these procedures undergo medical evaluation and laboratory tests.^{6,7} Ophthalmologists usually request these tests for different reasons: belief that cataract patients tend to be elderly and have serious coexisting illnesses; the individual cost of the test is low,^{8,9} to defend themselves against lawsuits, because it is the practice in the institution where they work.¹⁰

The overall usefulness of the laboratory tests (FBC, PCV, urinalysis and FBS) has been viewed with some reservation, particularly because the patients are usually relatively healthy and the surgeries normally carry low risk since they are mostly carried out under local anaesthesia.¹¹ It is, therefore, necessary to assess (from the medical point of view) the need for these tests in ophthalmological practice in Nigeria because the overall cost, for a low-income developing economy such as ours and to an already overburdened public health service is very high.

The most requested routine preoperative laboratory tests for cataract and glaucoma surgery at the University

of Ilorin Teaching Hospital are PCV, FBC and blood glucose (fasting/random blood sugar) assessments. This study investigated the outcome and the relevance of routine medical testing before cataract and glaucoma surgery in the hospital.

MATERIALS AND METHODS

The records of all patients who had cataract/glaucoma surgery at the University of Ilorin Teaching Hospital (UITH) over a one and a half year period between October 2002 and March 2004 were reviewed retrospectively.

Data assessed include age and sex of the patients, type of surgery done, laboratory tests requested and the result of such tests. Cases with previous histories of diabetes were excluded from the study.

Data collected were analyzed using the Epi-Info 6 statistical package.

Fasting blood sugar was considered normal if ≤ 6.0 mmol/L, and high if >6.0 mmol/L. Packed cell volume was normal if $\geq 30\%$, and low if $<30\%$.

RESULTS

The records of 250 patients who had surgery for cataract and/or glaucoma at UITH during the study period were reviewed.

The age range was between 1 and 90 years with a mean of 56.54 SD \pm 19. Majority of the patients (81.2%) were in the age range between 40 and 79 years. There were 134 (53.6%) males and 116 (46.4%) females giving a male to female ratio of 1.2:1 as shown in table 1. Surgery was performed on 214 (85.6%) cases of cataract, 33 (13.2%) glaucoma, and 3 (1.2%) for combined cataract and glaucoma. Local anaesthesia was employed in 229 cases and general anaesthesia in 21 cases.

Table 1. Age and sex distribution of patients who had cataract/glaucoma surgeries

Age group	Male	Female	%
0 to 19	10	6	6.4
20 to 39	9	5	5.6
40 to 59	49	28	30.8
60 to 79	62	64	50.4
80 to 99	4	13	6.8
Total	134	116	100

Table 2 shows that 235 (94.0%) of the patients had normal FBS (2-6 mmol/L), while 15 (6.0%) had high FBS (>6 mmol/L). The mean FBS was 3.49, SD \pm 1.87. The PCV records for 186 patients were available for review. Of these, 178 (95.7%) had normal PCV of 30% and

above. The mean PCV was 28.12 SD \pm 17.1. Eight (4.3%) patients had PCV that were less than 30%. None of these patients had perioperative complications or blood transfusion perioperatively. The 2 patients whose PCVs were less than 23% were found to be clinically pale; stool microscopy showed hookworm infestation for which they were treated.

Table 2. Routine laboratory investigation done before cataract and glaucoma surgeries

Investigation	Frequency	Percentage
FBS (mmol/L)		
High > 6	15	6
Normal 2-6	235	94
Total	250	100
P=0.000000		
PCV		
Low $< 30\%$	8	4.3
$\leq 23\%$	2	1.1
27% - 29%	6	3.2
Normal $\geq 30\%$	178	95.7
30% - 35%	51	27.4
36% - 50%	127	68.3
Total	186	100
P=000000		

DISCUSSION

Cataract surgery has been proven to be a highly effective and safe procedure with significant improvement in visual function and quality of life. Preoperative evaluation often involves a comprehensive medical evaluation including laboratory testing such as FBC/PCV, FBS, etc.

Though laboratory tests are estimated to cost about \$150 million each year in the United States,^{10,11-13} the cost to patients and public health service in Nigeria is unknown. Cataract and glaucoma are more common in people above 40 years.¹⁴ It was therefore not unexpected that the majority (81.2%) of the patients were aged between 40 and 79 years.

Diabetes mellitus has a known predisposition to lens opacity and has been defined by WHO as a syndrome of multiple aetiologies characterized by chronic hyperglycaemia with disturbances to the metabolism of carbohydrate, fat and protein due to deficiency in the action of insulin on target tissues.¹⁵ The upper limit for normoglycaemia is 6.0mmol/L and a patient is diagnosed with diabetes if he/she has a plasma fasting glucose (PFG) of ≥ 7 mmol/L.¹⁶ Diabetes mellitus can be detected in most cases by eliciting

specific and relevant information concerning diabetes from the history of the patient. In such cases, tests for diabetes can be requested specifically for patients who need them. This would reduce the cost and other bureaucratic bottlenecks in treating cataracts which, among other things, constitute barriers to the utilization of cataract surgery by patients.¹⁷

This study showed that the majority 235 (94%) of the patients screened for diabetes by routine FBS had normal result while the remaining 6% had a high FBS. This significant ($p=0.0000$) difference between the number of patients with a normal FBS value and those with a higher than normal value makes it unnecessary to test all patients routinely.

Both cataract surgery and trabeculectomy rank among the relatively bloodless surgeries performed in Medicare.¹⁰ In most cases, routine clinical check for pallor correlates well with the heamatocrit level, and anaemic patients can be picked and confirmed by PCV/Hb test. Of those who had records for the PCV/Hb test, 95.7% had a normal value of $\geq 30\%$, while the remaining 8 (4.3%) patients whose PCV were $<30\%$ still had no perioperative complications or blood transfusion before or after the surgery. The 2 patients with $PCV \leq 23\%$ were found to be clinically pale on examination. On examination, they were found to have hookworm infestation and were treated accordingly.

The fact that most of the test results were normal in the majority of these patients, and the minimal contribution of these tests to the outcome of cataract and glaucoma surgeries further confirm the findings in 2 large, randomized, and controlled multi-centre trials in which 2 groups of patients were randomized to routine preoperative laboratory testing and non or selective laboratory testing. These trials showed that the overall rate of cumulative medical complications following cataract surgery was between 3% and 9.7%, and the complications were similar in the two groups of patients and were generally not serious nor life-threatening.^{12,18}

Preoperative laboratory tests are good for the confirmation of diagnosis or the resolution doubtful cases once the need for them has been justifiably established from the point of medical necessity.

CONCLUSION

The result of routine FBC/PCV and FBS testing before cataract and glaucoma surgeries were normal in the majority of the patients studied. Routine preoperative laboratory testing before cataract and glaucoma surgeries is therefore considered unnecessary. Instead, close attention should be paid to the overall medical status of the patients to obviate the need for medical tests which often lead to delay in the performance of the

procedure. From this assessment, selected patients for whom it is necessary can then have comprehensive, more efficient, and cost effective laboratory testing.

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