Journal of Optometry: Open Access

Research Article Open Access

How Accurate is a Previous Diagnosis of "Cataract"?

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Received date: August 03, 2021; **Accepted date:** August 17, 2021; **Published date:** August 24, 2021

Citation: Varner P (2021) How Accurate is a Previous Diagnosis of "Cataract"/? J Optom Open Access, Vol.6 Iss.5 No:148.

Abstract

Purpose: To determine the accuracy of a previous diagnosis of cataract in patients presenting to a VA Medical Centre in SE Missouri, and to ascertain whether patient anxiety influenced this diagnosis.

Methods: 100 consecutive patients self-reporting a prior diagnosis of cataract were examined for accuracy of diagnosis. Standard Snellen visual acuity was used as the primary outcome. Cortical and posterior subcapsular cataracts were graded based on proximity to visual axis; nuclear sclerotic cataracts were classified based on a previously-reported grading scale of the author. Medical records were examined for pre-existing diagnosis of anxiety or generalized anxiety disorder.

Results: Only 15% of patients with a pre-existing diagnosis of cataract were found to have lenticular opacities causing decrease in best-corrected visual acuity.

Conclusions: Previous diagnosis of cataract is often inaccurate and far exceeds reporting misdiagnosis rates. Strict definition of cataract is not followed in this part of the United States.

Introduction

Diagnosis is the foundation of health care. It is the process of identifying and naming an illness, disease, injury, health condition, or other problem by examination of symptoms, physical signs, and test results. Patients seek care based on the assumption that providers can offer correct diagnoses, while treatment and prognosis are not possible without accuracy in its determination [1].

The stigma of misdiagnosis pervades all aspects of health care as providers are expected to be infallible. Of course, humans are not. Misdiagnosis rates consistently run about 10-15% across most medical specialties, and provider over-confidence may be both the source and a barrier to reducing this rate. Misdiagnosis can result in mental anguish, delay of care, untold morbidity, and even mortality, the latter of which is – fortunately – rare through the delivery of eye care [2].

The complex and often nebulous world of patient communication is frequently confounded by busy clinic schedules and unavoidable interruptions, while providers are challenged to meet patient expectations on their terms. However, there are certain key words that patients seem to remember no matter how difficult and distracting the situation. Words fraught with profound psychological connotations like pregnancy, cancer, tumour, stroke, heart attack, Alzheimer's, autism, blindness – among others – cannot be rescinded once tendered to patients [3].

To this might be added "cataract" – a diagnosis frequently mentioned by patients to their eye care providers. Nearly all patients are familiar with this term even if they do not understand the anatomical basis for it. As there is no other treatment available for this condition, laymen immediately correlate this diagnosis with surgery which, in turn, is usually associated with hospitals, general anesthesia, and morbidity in general. Like other significant diagnoses, ophthalmic patients do not "forget" once they have been told they have "the beginning of cataracts." [4].

That people recognize the term "cataract" should come as no surprise, given its ubiquity. In 2015, 3.6 million cataract surgeries were performed in the United States and 20 million worldwide. These ophthalmic procedures are "thought to be the most effective surgical procedure in any field of medicine." With modern techniques and procedures, reported complication rates are <2% for uncomplicated cases, and residual, post-operative refractive error often remains <0.5D, that is stable over the ensuing 10 years. The high frequency, low complication rate, limited pain, quick recovery time, and excellent clinical outcomes have created heightened expectations regarding cataract and its treatment for both patients and surgeons [5].

These factors have combined to create an enviable clinical situation where the outcome of a surgical intervention (i.e. cataract surgery) has seemingly surpassed diagnostic capabilities, rendering the accuracy of cataract diagnosis less critical in the process.

By definition, a cataract is opacity of the crystalline lens. There are various types of cataract, yet true opacities of the lens are pathological, impair vision, and are unnatural states of the eye. The yellow discoloration associated with senescent lens changing (nuclear sclerosis) represents a change in color of the lens but does not necessarily impair vision in and of itself.

The difference between "nuclear sclerosis" (NS) and "nuclear sclerotic cataract" (NSC) is an important one as giving a patient a diagnosis of "cataract" is not a benign event. Even after discussions of

the safety of cataract extraction and lack of general anesthesia, this procedure remains a "surgery." And with surgery comes anxiety: "a conscious state of worry over a future unwanted event or fear of an actual situation". Anxiety associated with cataract surgery is well-documented, and surgery on the eyes has the perceived threat of blindness.

Because cataract surgery is so successful and providers encounter the wonderful outcomes daily, it is difficult to remember that patients are not privy to this wealth of experience and knowledge. When eye doctors encounter veritable cataracts (i.e. vision impairment directly attributable to lenticular sources), the impact of this diagnosis is often obscured by the generally-successful, visually-rewarding outcomes. Even primary care providers and nurses tend to treat cataract as an inconsequential health care event.

Thus, a diagnosis of cataract does not cause eye providers a great deal of anxiety, but it is not one to be taken lightly regarding the affected patients especially during the hectic pace of the clinical day or when clinical findings do not align.

Materials and Methods

A trend regarding patient referrals was observed in this government medical facility eye clinic in which patients previously diagnosed with "cataracts" were often found to refract to 6/6 (20/20). As "normal" Snellen visual acuity is incompatible with the standard definitions of cataract, this author sought to determine the source of this discrepancy.

100 consecutive patients presenting to a Veterans Affairs (VA) Medical Center in Southeast Missouri who self-reported a previous diagnosis of "cataract" were included for study. This information was not solicited but was volunteered by each patient involved in this review. Nearly all the patients were new to this medical treatment facility. Data collection occurred over the first nine months of 2019.

The patient's gender and age at the time of "cataract" diagnosis and the eye(s) involved were noted, as well as the profession of the diagnosing provider. A distinction was also made between VA and non-VA providers.

Best-corrected visual acuities were determined through manifest refraction and ocular health exams were completed on all subjects to discover other potential sources that could confound the earlier diagnosis (i.e. a patient misinterpreting glaucoma for cataract, concurrent corneal or retinal disease, pre-existing amblyopia, etc.).

Specific attention was paid to clinical description of the physiological lenses, with classification according to type of opacity. For the purposes of this review, cortical and posterior subcapsular cataract were graded solely on proximity to visual axis; whereas nuclear sclerosis was compared to a photographic grading scale previously established for this eye clinic.

Contrast sensitivity, adaptation times, glare testing, aberrometry, and other measures were not included in this review, as these tests are not universally performed in most eye clinics. Finally, patient medical records were reviewed in order to determine the presence of pre-existing diagnoses of anxiety or general anxiety disorder.

Results

The average age of the patients investigated was 66 (range 45 – 84, age distribution in Table 1); only four were female. 86 of the cohorts reported a previous diagnosis of "cataract" in both eyes, leaving 14 with a reported history of unilateral findings. Presumptive sources for unilaterality of diagnosis are provided in– only one of these subjects truly had a visually-significant cataract in one eye.

< 49	1
50-54	4
55-59	13
60-64	12
65-69	37
70-74	24
75-79	7
>80	2

Table 1: Age-distributions of patients at time of diagnosis.

The cohort received their cataract diagnosis from an optometrist (34 from within VA and 44 from non-VA sites), 18 from an ophthalmologist (4 within VA, 14 without), and 4 were diagnosed by other VA employees (two by technicians, one by a nurse, and one by a primary care physician).

Out of 100 cases with pre-existing diagnosis of "cataract," 78 of the patients were improved by refraction. 58 of the 78 patients were found to have minimal NS; whereas seven subjects were found to have "clear" lenses (no NS whatsoever).

Of the group that refracted to 6/6 (20/20), 13 cases could be considered "confounders." Nine subjects were found to have off-axis cataract (cortical or posterior subcapsular) and might, therefore, be termed "clinically-insignificant" cataract. Two additional cases maintained "normal" Snellen visual acuity despite the appearance of objective NSC, and two more subjects noted persistent visual defocus after refraction despite minimal lenticular NS. The latter patients aged 67 and 78, and the source of the subjective visual symptoms was attributed to higher-order lenticular aberrations, as both subjects manifested only trace NS in both eyes.

22 subjects did not refract to 6/6 (20/20) initially. Twenty of these subjects had 6/12 (20/40) or better visual acuity in both eyes, with one

eye found to be 6/30 (20/100) and another eye of a different subject with a mature cataract and LP vision (both fellow eyes were 6/9, or 20/30, however).

Seven of these patients were found to have other confounders that precluded improvement of subjective vision: questionable efforts/responses during refraction, poor ocular surface, pre-existing 6/9 (20/30) amblyopia, and prior focal laser treatment of macula. In each of these cases, the lenticular changes were only the very earliest yellowing associated with senescent nuclear sclerosis (NS), and not opacification associated with nuclear sclerotic cataract (NSC). With the exceptions of pre-existing 6/9 (20/30) amblyopia and 6/7.5 (20/25) best-corrected visual acuity following prior retina treatment, subsequent refraction revealed 6/6 (20/20) vision for these cases.

Thus, 15 patients were found to have veritable cataract as the only source for decrease in vision. 13 were from an optometrist (9 from within VA and 4 from without), 2 from an ophthalmologist (both from non-VA providers), ultimately, 5 of these 15 cases declined referral for cataract extraction (neither of the marked cataract cases). Results of all 100 cases are summarized.

The overall misdiagnosis rate was 85% (83% for optometrists, 78% for ophthalmologists). None of the four subjects diagnosed by non-eye providers was found to have verifiable cataract.

Finally, review of medical histories revealed that 18 patients (1 female) had a pre-existing, clinical diagnosis of "anxiety" or "general anxiety disorder." Only two of these patients (both male) were found to have genuine lens opacification during this review.

Discussion

The average age of this cohort at time of cataract diagnosis was 66 years of age. This finding is consistent with the average reported age of 68 years for patients undergoing cataract surgery in the US, although a wide range of ages was found. As is well-known, cataract prevalence increases with age and is low for patients younger than 60 years of age.

It was difficult to understand how so many patients with 20/20 (6/6) vision had been diagnosed with "cataract." Of the 85 patients who did not have a cataract, 58 were graded as having minimal NS OU and 7 patients judged as having clear lenses – only two of the latter group were poor responders during refraction.

However, based on this review, it must be concluded that the natural, senescent process of yellowing in the lens (nuclear sclerosis) is being interpreted and diagnosed as cataract. This appears to be the practice of both optometrists and ophthalmologists, even though this is not consistent with a rigorous definition for "cataract" – i.e. opacification (cloudiness) of the lens.

Furthermore, several findings confound a straightforward diagnosis, and it may be conjectured that inadequate subjective responses during manifest refraction and/or poor ocular surface resulting in sub-normal vision – in the presence of minimal NS – lead to premature diagnosis of visually-significant cataract. Other confounders also lead to "cataract" diagnosis: cases of off-axis cataract, non-correlation of subjective and objective findings (6/6 [20/20] vision in the presence of demonstrable NSC), and higher-order lenticular aberrations (subjective blur, yet normal visual acuity and minimal lenticular changes). However, subtraction of those cases does not reconcile the findings of this review with reported misdiagnosis rates.

Finally, it must be noted that the patient report of "cataract" found during this review is not driven by mental health factors. Some degree of anxiety is perfectly normal in stressful situation – and the thought of eye surgery is a stressor for some patients.

Clinical anxiety is the most common mental health diagnosis in the United States with a reported annual prevalence of 19%. 18% of the subjects in this cohort were found to have a documented clinical diagnosis of anxiety or general anxiety disorder, but only two of the 18 patients had a verifiable cataract – and one of those patients (6/9, 20/30) delayed referral for cataract surgery due to lack of subjective visual symptoms. Thus, it does not appear that a diagnosis of cataract is creating a pathological state for patients – i.e. having intrusive thoughts, avoidance behaviours and associated physical symptoms.

Conclusion

The results of this case series revealed a misdiagnosis rate for cataract (85%) that far exceeded reported error frequencies across medical subspecialties. The strict definition of cataract is not followed in this locality of the US and the preponderance of diagnoses appears to rest on misinterpretation of NS for NSC. It also seems that non-objective diagnosis of "cataract" is often used to explain some cases of subnormal vision for those patients with difficult refractions and eyes without objective explanation, or those confounded by poor ocular surface. Eye providers are not creating a pathological state of anxiety by giving this diagnosis to patients, but the diagnosis of "cataract" is not quickly – if ever – forgotten. The ethics involved in this process is the domain of future research. These preliminary findings require confirmation, but based on the results of this review, eye care providers should not trust the accuracy of a previous diagnosis of cataract.

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