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A cross-sectional case-control hospital-based study of the relationship of vitreous opacities in cataract on elderly persons

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Abstract
Both cataract and vitreous opacity are affected on vision. With ultrasonography "traction", "contraction", "organization", "opacity" of the vitreous is standardized nomenclature in respect of both nature and location, and surgical techniques have been applied as necessary. With 3 degrees of vitreous opacity classification by ultrasonography, a cross- sectional case-control hospital-based study of the relationship of vitreous opacity in two groups: cataract and no cataract, subgroup operated cataract and un-operated cataract are primarily carried out on people who were 50 and over year-old. The relationship of vitreous opacity between un-operated cataract and operated cataract is different in statistics ($p<0.05$) and the prevalence of vitreous opacity by ultrasonography was confirmed and some results are reported herein.

Keywords: case-control hospital-based study, vitreous opacities by ultrasonography, cataract and no cataract, operated cataract and unoperated cataract

1. Introduction
The vitreous is normally transparent, consists of collagen fibrils and hyaluronic acid molecules with the absence of blood vessels and cells. It is principally maintained by the blood-retinal barrier. Disturbances of intrinsic vitreous biochemistry are generally responsible for vitreous opacity (VO). Both cataract and vitreous opacity are affected on vision. In the past, the transparency of the vitreous and associated problems of detailed clinical examination resulted in poorly defined concepts of vitreous pathology. With ultrasonography "traction", "contraction", "organization" of the vitreous is standardized nomenclature in respect of both nature and location, and surgical techniques have been applied as necessary [1,2,3]. Before ultrasonography vitreous opacity images in medical literature is rare and with ultrasonography, vitreous opacity is an evidence-based medicine up to now [4]. To our knowledge there is no classification of vitreous opacity in medical literature. and with 3 degrees of vitreous opacity classification by ultrasonography [4], a cross- sectional case-control hospital-based study of the relationship of vitreous opacity in two groups: cataract and no cataract; subgroup operated cataract and un-operated cataract are primarily carried out and the prevalence of vitreous opacity by ultrasonography was investigated on people who were 50 and over year-old.

2. Methods and participants
1-A cross-sectional hospital-based study was carried for prevalence of vitreous opacity on 1,975 consecutive patients who were 50 and over year-old consisted of: 1108 men and 867 women who were examined by one ophthalmologist.
2 A case-control study investigated the relationship between cataract group and non-cataract group as well as operated cataract and un-operated cataract, each group 200 patients. Trauma, uveitis were excluded in this study.
3 Principal measurements: The vitreous opacity was examined by ultra-scan imaging system:
Alcon/version 2.02, probes 10 MHZ, speed 12HZ, high 3-6mm, caliper measuring accuracy 1mm or 3%. Six basic probe positions according to Cynthia J Kendall [2] as follow:
1. Horizontal transverse at 6 o'clock,
2. Vertical transverse at 9 o'clock,
3. Horizontal transverse at 12 o'clock,
4. Vertical transverse at 3 o'clock,
5. Vertical axial: over cornea and,
6. Horizontal axial at 4-5 o'clock, this is scan that will image the macula (Figure).

People with opacity in one eye were selected for study. If opacities in both eyes, eye with higher opacity has been analyzed. Cataract examination was done by direct ophthalmoscope Hein, indirect ophthalmoscope Scheepen [3].

3. Results
(Table 1, 2, 3). Mean age (years) was 65.1±11.2; range: 50-89

Table 1: Distribution of vitreous opacity according to sex on population ≥ 50 years old

	Male: Number (percent)	Female: Number (percent)	Total: Number (percent)
Vitreous opacity	869	711	1580(80)
No vitreous opacity	349	156	395(20)
Total	867	867	1975

Table 2: The percentage of vitreous opacity according to cataract and no cataract

	Cataract: Number (percent)	No cataract: Number (percent)	Total
Vitreous opacity	140(70)	132(66)	172
No vitreous opacity	60(30)	68(34)	128
Total	200	200	200

OR=1.2, CI 95%=0.7-1.8; p=0.39.

In this case-control study hospital-based study, the prevalence of VO on cataract group and no cataract group was 70% vs 66% (140/200 persons vs 132/200 persons) [4], whereas the prevalence of cataract was 44.9% (887/1975 persons) higher than a population-based study 33% in 1998. [5]

Table 3: The vitreous opacity according to operated cataract and un operated cataract

	Operated cataract (Number)	Un operated cataract (Number)
Vitreous opacity	51	39
No vitreous opacity	20	32
Total	71	71

OR=2.1, CI 95%=0.9-4.4; p=0.04

The OR is 2, 1, p=0, 04 of vitreous opacity between 2 groups: operated cataract and unoperated cataract

4. Discussion

According to John A Fielding with asteroid hyalosis, this is a senile degenerative disorder of an unknown origin occurring unieye in 75% of cases [6]. In this study the prevalence of VO on persons ≥ 50 years old is primarily investigate with result showed 80% ± 3.2%. This prevalence is relative high because the study was performed on the consecutive patients at eye hospital, was not a population-based study but this prevalence is primarily put a problem for ophthalmologists. The disadvantage this study do not study the relationship of vitreous opacity and the visual acuity.

There are many causes of the vitreous opacity. Asteroid hyalosis occurs in otherwise healthy eyes in elderly people. The opacities have little or no effect upon vision and are no clinical significance. Synchysis scintillans is white cholesterol crystals, has its onset before age 40 but no relationship has been established with elevated blood cholesterol. Asteroid hyalosis and calcium have strong echoes. Weaker echoes are noted from clotted vitreous cell. Amyloidosis is a prealbumin, can be affecting partially vision according to size as well as position. Vitreous hemorrhage is an uncommon but serious disorder. It is usually due to traumatic rupture of a retinal vessel that caused posterior vitreous detachment (7-12%), retinal detachment (7-17%), endovascular post occlusion of the retinal vein (3-10%), but may related to diabetes mellitus (39-54%), hypertension, perivascularitis, Eal's disease…Ultrasound can assess for the presence of a tractional retinal detachment involving the fovea when visualization is occurred by vitreous hemorrhage [7].

This study VO was considered as a sign of case-control study compared the relationship between cataract and no cataract patients. All the cases of trauma and uveitis are excluded in this study. In our case-control study we assessed the vitreous opacity between cataract and no cataract by the odds ratio: 1.2, 95% confidence interval 0.7 to 1.8, p=0.39. (Table 2). Vitreous physically buffers in the internal ocular organs from shock and trauma. It also acts as a nutrient and waste products reservoir for the surrounding tissues. Glucose is taken up the metabolic in retina and lens, sodium and potassium are exchanged at the lens posterior surface, and magnesium is secreted into the vitreous from the retina, lactate and pyruvate diffused from the retina into posterior vitreous. Both ageing and metabolic diseases can affect the vitreous body; the collagen network tends to collapse forming small lakes of fluid in the matrix. Diabetes may change the collagen as well as amino sugar of the vitreous caused vitreal contraction and detachment [8]. The artifact may be excluded vitreous opacity [9]. Vitreous opacities can be classified according to their aetiology [10]

The odds ratio of the VO between operated cataract and unoperated cataract was 2.1, ninety-five percent of confidence interval was 0.9 to 4.4, p=0.04. This is different in statistics. (Table 3). The ocular disorders after lens extraction may be increased the risks for VO. Therefore, a further prospective study of VO on pre and post lens extraction should be done for identifying.

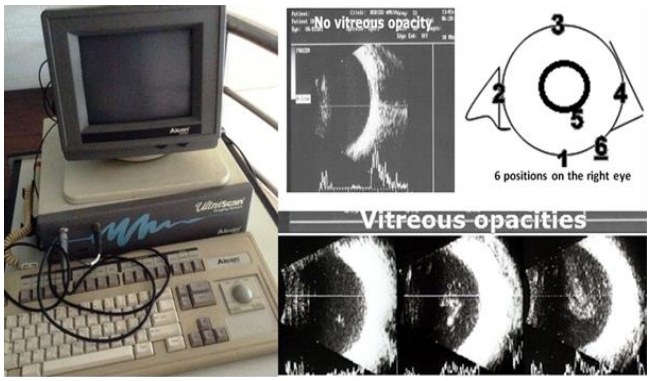

Fig 1: No vitreous opacity and 3 degrees of vitreous opacities ultrasonography [4]:

5. Conclusion

1. The relationship of vitreous opacity between unoperated cataract and operated cataract is different in statistics ($p<0.05$) and a prospective study should be done for identifying. The ultrasonography is cost benefit, effective, unharmful for patients, should be done for preoperative cataract patients in mobile cataract surgery camps (high volume) for screening preoperation as well as in prognosis vision post operation.
2. The prevalence of vitreous opacity on elderly persons is 80% ± 3.2%; further study should be done for risk factors and the relationship of vitreous opacity with visual acuity.

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