

THE EMERGENCE OF ASTEROID HYALOSIS AS A SONOLOGIST'S MARKER OF DIABETES

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ABSTRACT

Asteroid Hyalosis (AH) occurs because of the accumulation of calcium soaps in vitreous of the eyes. B Scan of eyes demonstrates them as shiny star-like discrete objects suspended in vitreous that obscure a clear view of fundus. Although asymptomatic and unilateral and it is seen more often in the diabetic patients.

A prospective double blind study was undertaken to evaluate the utility of AH to identify diabetic individuals. The overall incidence of AH in our study was 16 % in non-diabetic population and 70 % in diabetic population. Our results show that the presence of AH on B Scan is 88.60 % sensitive and 41.81 % specific to identify presence of diabetes. Hence the routine use of ocular ultrasound in various health screening programmes along with the traditional ultrasound evaluation of abdomen and pelvis is strongly recommended.

Keywords: Asteroid Hyalosis, Diabetes, Ocular Ultrasound

Introduction

Asteroid Hyalosis (AH) is the occurrence of calcium soaps suspended in the vitreous of one or both eyes. Although invisible to the naked unaided eye, non-invasive Ocular Ultrasound and Fundoscopy can demonstrate them beautifully.

High spikes are seen on the A scan vector. On B scan imaging,¹⁻¹⁰ normal posterior segment of eye appears clean and echo free (Fig.1). In presence of AH discrete mobile point like bright echoes without any posterior acoustic shadowing (Fig.1) and considerable after movements (Fig.2) are seen in the vitreous. The media appears hazy on fundoscopy and AH is seen as shiny highly refractive bodies in the vitreous (Fig.3).

Although the exact etiology is unknown, it has been reported in 30 -70% of diabetics.¹⁻¹⁰ A prospective

double blind study was therefore undertaken to evaluate if presence of AH can be used as a marker to assess the presence of diabetes.

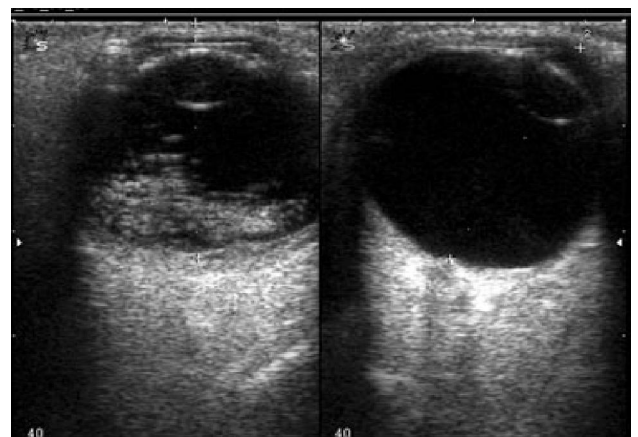


Figure 1: On B scan, normal vitreous is echo free as seen in left eye, whereas the Asteroid Hyalosis is seen as bright echoes in vitreous in right eye.

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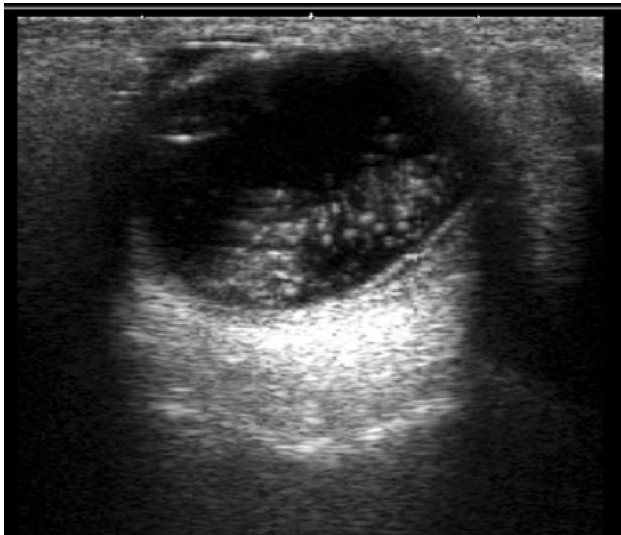


Figure 2: After movements of Asteroid Hyalosis following eye movement.

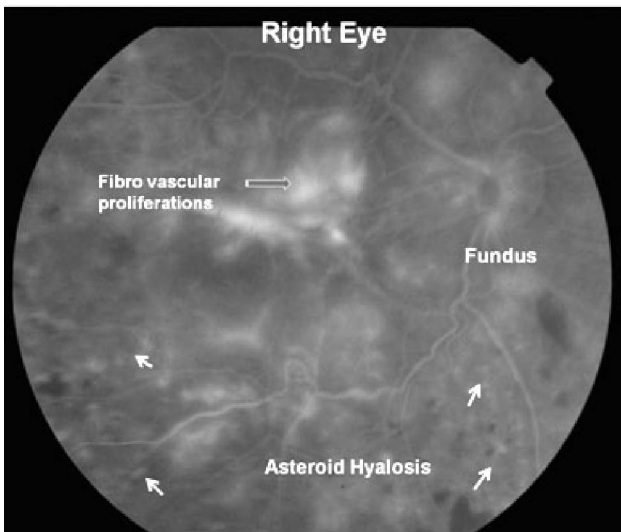


Figure 3: Asteroid Hyalosis on Fundus Fluorescence Angiography

Materials and Methods

After approval from institutional ethical and research committee, 200 non diabetic patients and 100 known diabetic patients, between 40-55 years of age were recruited in this study. Oral consent was obtained from all, prior to B scan of these patients to assess for the presence of AH.

For B Scan, the patient was placed in the supine position and 8-12 MHz frequency linear ultrasound probe was placed directly over closed lids after applying a coupling agent or jelly to avoid attenuation caused by air.²⁻⁶

Results

The observations were then tabulated as follows:

Participants	Non diabetic	Diabetic	Total
Males	112	73	185
Females	88	27	115
Total	200	100	300
Participants	AH Present	AH Present	Total
Males	19	58	77
Females	13	12	25
Total	32	70	102
Incidence	16%	70%	

Table 1: Distribution of participants in the study

The overall incidence of AH was 70 % in diabetics and 16% in non diabetics.

Various statistical calculations were then made as shown in (Tab. 2).

Sr. No.	Statistical Parameters	Formula	Values	% Results
1	Sensitivity	$\frac{TP \times 100}{TP + FN}$	$\frac{70 \times 100}{79}$	88.60
2	Specificity	$\frac{TN \times 100}{TN + FP}$	$\frac{23 \times 100}{55}$	41.81

Table 2: Statistical Parameters observed in the study

Our results show that the presence of AH on B Scan is 88.60 % sensitive and 41.81 % specific to identify presence of diabetes.

Discussion

Although AH is found to exist in 30 -70% of diabetics,^{1,10} the exact cause-effect mechanism is still unknown. In our study it was seen in 70 % of known diabetics. Moreover, presence of AH was sensitive and specific for occurrence of diabetes in individuals.

Although it was seen in non diabetic patients, no other disease entity could be associated with the occurrence of AH. For this purpose, we tried to see the association with hypertension, hyperlipidaemia, trauma and

prolonged use of glasses or spectacles or contact lenses.

Conclusion

The results this study leads us to believe that the incidence of AH is high in diabetic patients and that the presence of AH in non diabetics is an indicator that warrants follow up of these patients for subsequent development of diabetes. Therefore we suggest that while performing abdomen and pelvic ultrasound in healthy patients who come for routine annual health screening, ocular ultrasound or B scan must also be done to evaluate AH and frequent blood sugar estimates must done to watch for the development of diabetes.

As the exact cause-effect mechanism is not known. The change in severity of AH with changes in blood sugar levels also needs to be evaluated. Further studies are therefore needed.

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