Diabetic Retinopathy Screening - what have we learnt?

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Aim of current study

- Establish characteristics of patients with diabetes mellitus attending the Medical Retina Clinics at Moorfields Eye Hospital, London before the implementation of the national screening programme
- Consequently put processes in place to cope with the expected changes once screening is in place

Methods

- Patients attending the Medical Retina Clinics at the City Road site of MEH during a 4 weeks period in 2003 were interviewed about diabetes, complications, knowledge and treatment
- The interviews were administered by the same 3 person (IL, NH and SS) while patients were waiting to be seen by medical personnel

Participants

- During the 4 weeks period, 830 patients booked for consultations were identified with diabetes by reviewing medical charts
- 141 did not attend their visit
- 109 could not/would not wish to be interviewed
- 580 patients were interviewed
- Patients interviewed were more likely to have had laser treatment in the past (0.016)

Patient characteristics

- Median duration of diabetes was 10 years (0.3 years to 52 years)
- 74.3% had Type 2 diabetes
- 64.8% were known to have had hypertension
- 4.3% were registered partially sighted
- 4.7% were registered blind

Complications

- Heart disease 24%
- Stroke 9.7%
- Diabetic neuropathy 48.9%
- Diabetic nephropathy 13.4%
- 13.1% did not understand that eye and other complications were related to their diabetes
Ophthalmic treatment in the past and on the day

- 61.5% had previous fluorescein angiography
- 64.1% had previous laser treatment
- On the day, 5.8% had FFA and 13.4% had laser

Overall, 1/3rd of the patients never had ophthalmic intervention and about 80% of the patients had only an examination on the day!

Knowledge on laser treatment

- 51.6% did not understand how long it might take for the laser to act on diabetic eye disease or expected it to work immediately
- 16.6% expected to have one laser treatment ever

Why did the patients come?

- 82% came for a check up
- The rest had a wide variety of reasons, from "I was sent here", to "I think I have cataract because of my diabetes"

Medical personnel in clinic believed that the patients came for diabetic eye-check and predominantly for laser, but this is not mirrored in their actions.

1,884,712 patients with diabetes in England

The World Health Organisation (WHO) define screening as a public health service in which members of a defined population, who do not necessarily perceive they are at risk of, or are already affected by a disease or its complications, are asked a question or offered a test, to identify those individuals who are more likely to be helped than harmed by further tests or treatment to reduce the risk of a disease or its complications.

To set up a screening programme for a disease you must:
- have a well defined population with a genuine health problem
- be able to define who is at risk and who is not
- have an effective treatment available (it is unethical to screen if you cannot treat)
- have a cost-effective method of screening, including the loop from screening to clinic and back to screening

- National Screening Programme for Sight Threatening Diabetic Retinopathy

- Target – 100% of patients (age>12 yrs) with diabetes will have been offered retinal screening by end of 2007
- www.retinalscreening.nhs.uk

Progression to high risk proliferative diabetic retinopathy

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<th></th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
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<tbody>
<tr>
<td>1 yr</td>
<td>1%</td>
<td>3%</td>
<td>15%</td>
<td>45%</td>
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<tr>
<td>5 yrs</td>
<td>15%</td>
<td>27%</td>
<td>56%</td>
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When I grow up,

- I want to be a diabetic retinopathy screener/grader
- I want to spend my medical career fighting macular oedema!

Aim of Screening Programme for Diabetic Retinopathy

- Provide a service to patients with diabetes where all of them are in the appropriate clinical pathway without delay.

The areas of the two screening images per eye
Clinic or screening?

Will this patient come to clinic?
Yes – Dense Asteroid hyalosis – vessels not clearly visible within 1 disc diameter of the centre of the fovea

Will this patient come?

This patient will also come!
M1 – exudate within 1 disc diameter of centre of fovea

But this patient should be in screening

Problems with Screening
- Availability and population coverage
- Fundus photography system
- Grading form, severity scale
- Graders training
- Quality control
- Cost of the service
Availability and population coverage

- Who decides who should attend the services
- Should high risk/end stage patients be seen: amputees; on dialysis; registered blind

Fundus photography system

- How many fields?
  - 7-fields stereo is where our knowledge comes from
  - 3-fields and 2-fields have good correlation with ETDRS 7-field
  - 1-field does not seem to be specific/sensitive enough

- Which camera?
  - Only approved cameras are to be used
  - Slit-lamp biomicroscopy is a valid way in some countries!

- When?
  - Most countries screen yearly, but every two years might be enough if we have integrated diabetes care

Grading form – severity scale

- ETDRS Grading Form and Severity Scale
- National Guidelines on Screening for Diabetic Retinopathy System in the UK
- St Vincent Declaration Report Form
- Local forms

Quality control

- Major problem, very time-consuming
- Very difficult to assess the quality of screening programmes

EQA visit components

- PCT commissioning
- Call/recall administration
- Photography
- Grading
- Ophthalmology
- Process of co-ordination of each components of the programme

There might be more than one visits to complete all elements of the QA visit.

Screeener/grader training: Certificate in Diabetic Retinopathy Screening

- City and Guilds award this, and everyone who has worked in the screening for at least 2 years must do it by the end of their second year.
- Suitable for all personnel involved in the identification of sight threatening retinopathy after 2007.
- 3 mandatory units and 3 of 6 optional units.
- Optometrists gain exemptions from 3 units.
- More or less units will be required depending on a persons job role.
Who trains the doctors?

- It is a much needed component
- Clinical treatment schemes are usually different to screening referral level
- Doctors must understand why patients are being referred in order to avoid unnecessary discharge from clinics only to have the patient back in a few months

Cost

- What is the cost of screening?
  - Cost per years of blindness prevented?
  - Cost per image?
  - Cost for the program including treatment?
- Natural history should be taken into account
- **DR is consequence of diabetes mellitus**
- Hungary: 60% of examination time would be spent with screening if all patients with diabetes were to undergo regular examination

What improvements are needed?

- Automatic electronic referral systems without the need for referral letters to and from eye clinic and screening service
- Access to screening service pictures on normal hospital computer systems
- Appropriate finances to be put in place
- Integration with electronic patient record

Future directions

- OCT to be used to help grade maculopathy rather than stereo pairs which are rarely available. This may increase reliability of referral and reduce unnecessary referrals.
## Conclusion

- Patients attending the eye clinic had multiple co-morbidities even before the screening programmes started.
- With the screening programmes in place now, we expect to see patients who require investigation or treatment.
- This will increase the burden of personnel on clinic and on communication links.
- In order to make an impact on patient care, we will have to provide appropriate education and QA on every level.