The organisation of an ophthalmological service for diabetics in a teaching hospital

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Summary

A new system of ophthalmological evaluation of diabetic patients in a teaching hospital has been devised. All the patients attending the diabetic clinic were screened by ophthalmologists. Any patient with a problem was then referred to a diabetic ophthalmology clinic where a full evaluation was done and treatment given where necessary. In an 18-month period 1 015 new ophthalmological diabetic patients were screened. Of these patients 13.6% had background retinopathy, 8.4% pre-proliferative retinopathy, and 3.4% proliferative retinopathy, while 8.6% had maculopathy. These results show that even in a teaching hospital a significant percentage of patients already have pre-proliferative or even proliferative retinopathy when seen by an ophthalmologist for the first time. The importance of organising an ophthalmological service for the diabetic patient is stressed.

Diabetic retinopathy remains one of the most serious and frequent causes of blindness.1 Within recent years the treatment of diabetic retinopathy and of more advanced complications of retinopathy has been improved by the introduction of photocoagulation and vitrectomy. The most severe complication of diabetic retinopathy, destruction of vision, can at least be postponed by these therapeutic procedures. Early detection and demarcation of patients at risk is thus of vital importance.

The treatment of the ophthalmic diabetic patient has five facets,2 namely: (i) metabolic control; (ii) organisation of ophthalmological service; (iii) laser photocoagulation; (iv) microsurgery of posterior segment; and (v) low visual aids.

Before this study diabetics at Tygerberg Hospital were seen and evaluated by general practitioners and physicians. When eye disease was noted the patients were referred to the Department of Ophthalmology Diabetic Clinic where a full evaluation was done and thereafter their fundi were evaluated by an ophthalmologist. Evaluation of the fundi took place in a specially darkened room in the Diabetic Education Centre through undilated pupils (pupils were not dilated at this initial screening because of possible angle closure and inconvenience caused to patients by reduced visual acuity). Patients who fell into one of the following categories were referred to the Department of Ophthalmology Diabetic Clinic: (i) any evidence of retinopathy; (ii) fundus not readily visible; (iii) high-risk patients such as those with diabetes of long duration (5 years or more in diabetics over 40 years of age and 10 years or more in diabetics under 40 years of age); and (iv) poorly controlled diabetics.3,4 Patients with no diabetic eye disease were re-evaluated on a yearly basis at the Diabetic Education Centre.

After they had attended the Diabetic Education Centre, the patients were seen by a physician and attended other clinics, such as surgical, dietician, renal, etc. An appointment at the Department of Ophthalmology Diabetic Clinic was usually made to coincide with the patient’s next appointment at the hospital, so the patient would be seen in the afternoon after attending other clinics. However, if it were deemed necessary, the patient was seen at the Department of Ophthalmology Diabetic Clinic on the same day.

In the Ophthalmology Department the patient was fully evaluated with regard to visual acuity, a complete examination of the adnexae and anterior segment was performed and the intra-ocular pressures were recorded. A complete examination of the vitreous humour and retina through dilated pupils was carried out. Retinopathy, when present, was classified as follows, using the worse eye where there was a difference (on the assumption that the worse eye reflected more accurately the microvascular status of the patient): (i) background retinopathy — the presence of venous congestion, micro-anœurysms, hard exudates and/or scattered dot and blot haemorrhages; (ii) pre-proliferative retinopathy — the presence of signs of capillary non-perfusion such as cotton-wool spots, intraretinal microvascular abnormalities, venous loops, beading and widespread dot and blot haemorrhages; and (iii) proliferative retinopathy — the presence of neovascularisation or of complications of neovascularisation such as vitreous haemorrhage, tractional retinal detachment, etc.

The above forms are distinct phases in the progression of the disease and are important therapeutically. For example, background retinopathy requires regular re-evaluation only, while proliferative retinopathy needs to be treated urgently either by photocoagulation or by posterior segment surgery in the more advanced cases.

Patients and methods

In June 1984 a new system for registering diabetics was introduced at Tygerberg Hospital. The patient registered at reception and thereafter attended a diabetic information lecture and problem-oriented discussion at the Diabetic Education Centre which was led by a diabetic nursing sister and dietician.

Immediately after the lecture each patient’s details were entered on the Department of Ophthalmology Diabetics Clinic form and thereafter their fundi were evaluated by an ophthalmologist. Evaluation of the fundi took place in a specially darkened room in the Diabetic Education Centre through undilated pupils (pupils were not dilated at this initial screening because of possible angle closure and inconvenience caused to patients by reduced visual acuity).

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There exists a high risk of neovascularisation in eyes with pre-
proliferative retinopathy and these patients therefore need to be
re-examined more regularly.

Patients in any of the above three groups can also have maculo-
pathy. Maculopathy was defined as vascular leakage, exudation
and/or capillary closure involving or threatening to involve the
macula. Maculopathy was classified as follows: (i) focal —
exudates usually circinate in nature or forming the arc of a circle
with micro-aneurysms or groups of micro-aneurysms in the centre
involving or threatening to involve the macula; (ii) oedematous —
associated with capillary dilation and leakage and marked oedema
of the macula, sometimes with micro-aneurysms, haemorrhages,
exudates and even cystic retinal changes; and (iii) ischaemic —
associated with areas of retinal non-perfusion, although haemor-
rhages, oedema and exudates may also be present along with
cystoid oedema. It is important to distinguish between the three
types of maculopathy before deciding on therapy as the first type
has been shown to respond well to photocoagulation, whereas the
oedematous and ischaemic types do not.

Fluorescein angiography was not done routinely (owing to a
shortage of staff), but only when necessary to differentiate between
the three types of maculopathy, or to diagnose early neovascularisa-
tion. The required treatment was then initiated, further treatment
being dictated by the relevant pathological condition. An effort
was made to co-ordinate future appointments at the Ophthalmo-
logy Department with appointments at the various other clinics.

The evaluation and treatment of patients in the Ophthalmology
Department Diabetic Clinic was performed by the same ophthal-
mologist who had carried out the initial screening procedure in
the Diabetic Education Centre. A diabetic meeting was held once a
month at which problem areas were discussed by the staff involved
in the care and treatment of diabetics and lectures were given by
staff members in the various disciplines.

All diabetic patients admitted for control of their diabetes were
referred to the Ophthalmology Department Diabetic Clinic and
fully evaluated as described. All pregnant diabetics in the hospital
were evaluated in a similar manner. In the 18-month period from
June 1984 to December 1985, 1015 diabetic patients were evaluated
as outlined above. These patients had not previously been seen by
an ophthalmologist and excluded those already receiving treatment
from an ophthalmologist. Included in this group were 34 pregnant
diabetic patients.

Results

Of the 1015 patients evaluated, 757 (74,6%) had no retinopathy,
138 (13,6%) had background retinopathy, 85 (8,4%) had pre-
proliferative retinopathy and 35 (3,4%) had proliferative retino-
pathy. Six hundred and eighty-five (67,5%) of the patients
evaluated were females, and 330 (32,5%) were males. There were
257 males and 500 females in the non-retinopathy group, 38 males
and 23 females in the proliferative retinopathy group, 23 males
and 62 females in the pre-proliferative retinopathy group, and 12
males and 23 females in the proliferative retinopathy group.

The female group included 34 pregnant diabetics. Of these, 28
had no retinopathy, 4 had background retinopathy, 2 had pre-
proliferative retinopathy and none had proliferative retinopathy.
Eighty-seven of the above patients (with some retinopathy) also
were diabetics. Of these, 22 were males and 65 females. Seventy-two had focal maculopathy, 12 had ischaemic
maculopathy and 3 had oedematous maculopathy (Table I).

Discussion

It is evident that when seen for the first time by an ophthalm-
ologist, even in a teaching hospital such as Tygerberg, a
disturbing number of diabetic patients already have advanced
retinopathy.

It has been shown that as a group physicians, diabetologists
and medical registrars are not sufficiently adept at diagnosing
proliferative retinopathy. So that the diagnosis of diabetic eye
disease is not missed, ophthalmologists' opinions should be
obtained or eye examination skills improved. There seems to be
a need for individually tailored educational programmes for
primary care physicians as well as increased co-ordination of
care across specialties. It may be that greater educational
emphasis on the diagnosis of proliferative retinopathy during
pregraduate and postgraduate medical training would be an
effective strategy to ensure optimal patient care.

Loss of vision is always a tragedy, but the sudden onset of
blindness secondary to vitreous haemorrhage in a patient who
has been completely unaware that he was at risk is particularly
devastating. The anger and bewilderment of such a patient is
very poignant. The responsibility for the proper education,
examination, evaluation and appropriate referral of diabetic
patients falls on the shoulders of every member of the health
care team. A screening programme such as the one described
here should help in the identification and treatment of these
patients.

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for her assistance. We also thank the Chief Medical Superintendent
of Tygerberg Hospital for permission to publish.

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<th>Type of maculopathy</th>
<th>Male</th>
<th>Female</th>
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<tr>
<td>Focal</td>
<td>21</td>
<td>51</td>
<td>72</td>
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<tr>
<td>Ischaemic</td>
<td>11</td>
<td>11</td>
<td>22</td>
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<tr>
<td>Oedematous</td>
<td>3</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>22 (2.2%)</strong></td>
<td><strong>65 (6.4%)</strong></td>
<td><strong>87 (8.6%)</strong></td>
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*Percentage of total number of patients.