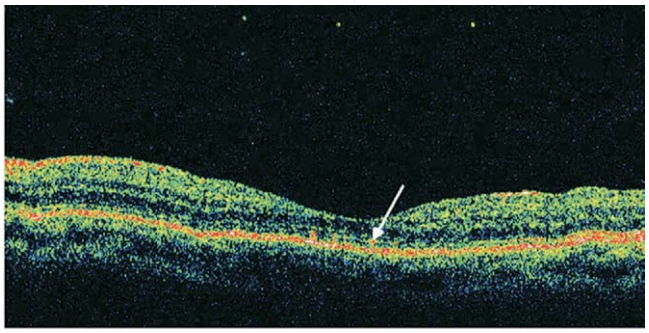

FIGURE 2. Postoperative optical coherence tomography (OCT3) scans nine months after surgery. OCT3 scan of a 35-year-old man (best-corrected visual acuity, 0.5) showing ruptures and hyperdensities at the junction line between photoreceptor cell inner segment and outer segments (arrow).

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Effect of Hospitalization on Intraocular Pressure in Patients With High Tension and Normal Tension Glaucoma

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PURPOSE: To determine the effect of hospitalization on intraocular pressure (IOP) in glaucoma patients.

DESIGN: Prospective case series.

METHODS: IOP was measured on three consecutive days in 26 high-tension (HTG) and 13 normal-tension (NTGwm) glaucoma patients under IOP-lowering treatment, and in 28 normal-tension glaucoma patients without IOP-lowering treatment (NTGnm), and change was compared by analysis of variance.

RESULTS: IOP decreased significantly, but comparably, in the three groups and between right and left eyes, although, the relative change to IOP on day 1 was significantly less pronounced in the group without treatment on day 2 and 3 compared with the treated groups.

CONCLUSIONS: Glaucoma patients showed a significant decrease in IOP during hospitalization. Although this decrease was more pronounced among the treated patients, it was also present in nontreated patients. Consequently, other factors than improved compliance during hospitalization must play a role in this phenomenon. (Am J Ophthalmol 2006;142:179–181. © 2006 by Elsevier Inc. All rights reserved.)

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FACTORS INFLUENCING INTRAOCULAR PRESSURE (IOP) include circadian rhythm,[1] psychologic stress,[2] sympathetic activity,[3] and isometric muscle contraction,[4] but little is known about the effect hospitalization has on IOP in primary open-angle glaucoma.[5,6]

Sixty-seven primary open angle glaucoma (POAG) patients (30 male, 37 female; mean ± SD age: 67.5 ± 13.7 years) were recruited prospectively. Patients were hospitalized for three days for risk factors evaluation. Diagnosis of POAG was based on two out of three criteria including glaucomatous visual field, glaucomatous optic neuropathy (GON), and retinal nerve fiber layer (RNFL) defects. Patients had open angles at gonioscopy, no clinical evidence for secondary glaucoma, and GON was present in both eyes.

Patients with a previously untreated average IOP above 21 mm Hg in a diurnal tension curve (five measurements obtained between 8 AM and 8 PM) were defined as high-tension glaucoma (HTG) and those with an IOP always below 21 mm Hg were defined as normal-tension glaucoma (NTG). Patients with a history of ocular surgery were excluded. Patients came to the hospital at 9 AM. IOP readings were obtained at 10 AM on three consecutive days by the same examiner, who was masked to the diagnosis. Hydration status, and food or fluid intake before hospitalization were not controlled. The patients spent three days mostly sitting and strolling in the hospitals garden. All patients got the standard meals of the institution and had free access to drinking water. IOP was always measured in a dark room using the same Goldmann applanation tonometer (Haag-Streit, Bern, Switzerland) after a resting period of at least 10 minutes. The variation in IOP was compared among HTG patients with medication (HTG), NTG patients with medication (NTGwm), and NTG patients without medication (NTGnm).

TABLE 1. Demographic Data of Glaucoma Patients Assessed for the Effect of Hospitalization on Intraocular Pressure

	HTG	NTGwm	NTGnm	*P* Value
Age (mean years ± SD)	72.4 ± 12.4	67.2 ± 11.7	63.1 ± 14.5	ANOVA: 0.042
Male/female	12/24	5/8	13/15	Chi-square: 0.88

HTG = high tension glaucoma patients; NTGwm = normal-tension glaucoma patients with local medication; NTGnm = normal-tension glaucoma patients without local medication; ANOVA = analysis of variance.

TABLE 2. Mean Intraocular Pressure (mm Hg) ± SD of Glaucoma Patients Assessed for the Effect of Hospitalization on Intraocular Pressure

	Right Eye			Left Eye		
Day	1	2	3	1	2	3
HTG	16.0 ± 3.7	13.2 ± 3.0	12.9 ± 2.9	16.3 ± 3.9	13.3 ± 3.0	13.5 ± 3.1
NTGwm	14.8 ± 4.5	11.2 ± 2.1	11.6 ± 2.2	15.3 ± 4.4	12.1 ± 2.4	12.3 ± 2.3
NTGnm	14.9 ± 2.4	13.5 ± 2.5	13.5 ± 2.3	14.9 ± 2.3	13.8 ± 2.1	13.7 ± 2.4

HTG = high tension glaucoma patients; NTGwm = normal-tension glaucoma patients with local medication; NTGnm = normal-tension glaucoma patients without local medication.

Demographic data are provided in Table 1. Age differed significantly (analysis of variance (ANOVA): $F(2,64) = 3.34$; $P = .042$), because of a significant difference between NTGnm and HTG patients (contrast analysis: $P = .042$). Age was comparable between NTGwm and NTGnm patients ($P = .36$). Gender distribution was even among the three groups ($\chi^2 = 0.261$; $P = .88$). IOP was comparable among the three groups ($F(2,64) = 1.64$; $P < .20$) and between right and left eyes ($F(2,64) = 3.87$; $P < .054$). IOP varied significantly (Rao $R(2,63) = 24.91$; $P < .0001$) during the three days, which was true for NTGnm ($P = .033$), NTGwm ($P = .0002$), and HTG ($P < .0001$) patients. This variation was comparable between the three groups (Rao $R(4,126) = 1.83$; $P = .13$) and right and left eyes (Rao $R(2,63) = 0.31$; $P = .73$) (Table 2). The relative decrease in IOP compared with day 1 were equivalent for day 2 and day 3 ($P = .77$) and this decrease were equivalent in right and left eyes ($P = .54$) (Table 3). The three groups differed with regard to the relative change in IOP (ANOVA: $F(2,64)$; $P = .0454$). A contrast analysis disclosed comparable variations among the treated groups ($P = .85$), while the NTGnm patients showed less variation compared with NTGwm ($P = .049$) and HTG patients ($P = .029$).

In two previous studies[5,6] comparing ambulatory IOPs with the IOPs after or before the patients were hospitalized, a decrease in IOP could be demonstrated as well, although without a properly standardized protocol. In our study, hospitalization was accompanied by a significant decrease in IOP, HTG, and NTG, but the three groups differed with regard to relative variation in IOP compared with baseline. Because the difference in age between the HTG and NTGnm groups is not reflected in the results with a significant difference between the treated (HTG, NTGwm) and untreated (NTGnm) groups, we believe that the different age cannot be an explanation for the results. Although, the decrease in IOP was more pronounced in the groups with IOP-lowering medication (HTG and NTGwm), suggesting a better compliance, at least in some of these patient, the IOP-lowering effect of hospitalization was also significant in the group without IOP-lowering medication, which suggests the possibility that, besides compliance, other factors such as psychologic stress[2] or alterations of the autonomic nervous system[7] may be involved.

TABLE 3. Relative (% ± SD) Decrease of Intraocular Pressure on Day 2 and 3 Compared to Day 1 of Glaucoma Patients Assessed for the Effect of Hospitalization on Intraocular Pressure

	Right Eye		Left Eye	
Day	2 vs 1	3 vs 1	2 vs 1	3 vs 1
HTG	16.4 ± 12.2	17.0 ± 19.3	16.6 ± 15.0	15.4 ± 14.8
NTGwm	18.8 ± 23.3	16.9 ± 22.1	17.6 ± 18.5	16.3 ± 17.5
NTGnm	7.2 ± 23.6	7.5 ± 20.0	5.6 ± 18.0	6.2 ± 19.2

HTG = high tension glaucoma patients; NTGwm = normal-tension glaucoma patients with local medication; NTGnm = normal-tension glaucoma patients without local medication.

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Pilot Study on In Vivo Evaluation of Retinal Vascular Maturity in Newborn Infants in the Context of Retinopathy of Prematurity

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PURPOSE: To study the extent of retinal vascularization at birth.

DESIGN: Prospective masked observational case series.

METHODS: One hundred ten neonates, at different weeks of gestation and birth weights (BWs), had dilated fundus evaluation for zone of retinal vascularization by a masked observer. Maternal and neonatal factors were ascertained by a masked pediatrician.

RESULTS: Irrespective of risk factors, eight of nine babies who were born at <30 weeks of gestation and at <1500 g BW had immature retina. Those babies who were born at >34 weeks of gestational age and at >1700 g BW had mature retina. Babies who were born between 31 to 34 weeks of gestation and at 1501 to 1700 g BW had variable extent of retinal vascularization at birth. Vascularization was affected by maternal anemia and the need for oxygen for >48 hours.

CONCLUSION: There exists considerable variability in the extent of retinal vascularization in infants who are born between 31 to 34 weeks of gestation. Modifiable maternal and fetal factors could influence extent of this vascularization birth. (Am J Ophthalmol 2006;142:181–183.

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IN PRETERM INFANTS, AN IMMATURE RETINA IS ESSENtial for retinopathy of prematurity to occur.[1,2] More severe retinopathy of prematurity occurs when retina is less mature.[2–4] A masked, prospective, cross-sectional, pilot study was done to assess the retinal vascular immaturity at birth. Modifiable maternal and neonatal factors that could influence retinal vascular status at birth were analyzed.

One hundred ten newborn infants in a tertiary maternity hospital were examined within first week of life by two masked observers (one retina-retinopathy of prematurity specialist [S.J.] and one pediatrician [C.M.]). After written informed consent from the parents and permission from the institute review committee, babies had dilated retinal examination according to established protocol.[1,3] The zone of vessels was documented by retinal drawings according to the international classification.[1–3] The pediatrician, who was masked to ocular findings, documented predefined maternal, fetal, and postnatal factors. Vascularization up to zone I and up to zone II were considered to be immature retina; vascularization up to zone III (retinal vessels up to nasal ora serrata) or beyond (including temporal ora serrata) was considered to be mature retina.[2] One eye was considered for analysis because both eyes were similar.

Retina was mature in 89 babies (81%) and immature in 21 babies (19%; 95% confidence interval [CI], 11.7 to

TABLE 1. Retinal Vascular Immaturity vs Gestational Age and Birth Weight

Variable	Babies (n)	Immature Retina (%)	95% CI
Gestational age (wk)			
28–30	9	8 (88.9%)	68–100
31–33	26	12 (46.2%)	27–65
34–36	26	1 (3.8%)	0–11
37–40	49	0 (0)	0–4
Birth weight (g)			
<1500	23	14 (60.9%)	41–81
>1500–1700	17	6 (35.3%)	12.6–58
>1700–2000	8	1 (12.5%)	0–29
>2000	62	0 (0)	0–3