International Pilot survey of Childhood Glaucoma (IPSOCG)

Background

The need for an international registry of childhood glaucoma was identified as an early goal for CGRN. However, after consideration of a number of software options under development, numerous challenges were identified to the current use of a universal detailed registry without duplication of data entry. It was concluded that the ideal scenario would be the existence internationally of a limited number of EMR's from which a detailed CGRN dataset would be 'extracted' to a server on a regular basis. However, although the development of computer interfaces is possible, in practice it is quite challenging and expensive.

As the CGRN was eager to capitalize on the momentum for this project it was decided to move forward with a pilot survey of major international centers around the world that manage childhood glaucoma to ascertain existing clinical practice. The aims were deliberately simple to allow timely commencement of the project.

Aims

1. To determine types of childhood glaucoma managed at major international centers
2. To determine approaches of care and identify national and international differences
3. To determine outcomes of IOP control and VA at 18 months initially, with the option to extend the observation period

Participating Investigators

See Appendix C

Study Protocol

After a subject agrees to participate in the study, Investigators will be asked to record any child who meets the eligibility criteria described below. Each center will enroll for one year from the date of their IRB approval and follow these patients for 18 months. Centers with IRB approval to do so will have the option to continue until all centers stop recruitment at advice of Study Group. Typically, potential subjects will be screened at the time of examination under anaesthesia (EUA) or sedation when the diagnosis is confirmed and surgery (eg. goniotomy, trabeculectomy, glaucoma drainage implant) performed where indicated, or in an outpatient/clinic setting. It includes children seen as both public and private patients.

<u>Inclusion criteria:</u>

1. Any child with **glaucoma** in at least one eye with **no previous glaucoma laser or surgical procedures** that **is new to your practice**
2. Fulfils the CGRN definition of childhood glaucoma (Appendix A of Study Protocol)
3. Includes children seen as both public and private patients

Exclusion criteria:

1. **previous glaucoma laser or incisional surgery in either eye**
2. **children with glaucoma currently under your care**
3. glaucoma suspects
4. availability of follow up outcome data unlikely even by referring outside source

The recruitment of patients can only begin after the IRB approval date.

Informed Consent

Each investigator will be required to obtain either IRB (or equivalent) approval or exemption for their center's participation in this study.

For centers requiring IRB approval, parents of affected children who meet the inclusion criteria and who agree to have their child participate in the study, will be asked to provide consent before any personal health information is transmitted to the study database. For minors an assent will be obtained according to IRB requirements.

In the UK informed consent is not necessary for this study as the dataset will not include any information by which the patient can be identified. Only the first half of the postcode (postcode district corresponding to a post town) is recorded to allow demographic analysis without the risk of patient identification inherent if a full postcode was stored. The data is 'effectively anonymised' as required by the NHS code of Practice on Confidentiality. This is compatible to the HIPPA guidelines in the United States.

Data Collection

On identifying a newly diagnosed child with glaucoma, investigators must complete baseline data. The dataset is divided into four sections, described as follows;

• Patient - demographic data about the patient, including history of consanguinity
• Baseline Assessment - diagnosis (refer Appendix B), laterality, visual acuity, lens status
• Management – medication, surgery, complications
• Outcomes - IOP control and visual acuity

Patient data collected will include date of birth and will require 3 separate entries for month, day, and year respectively. For centers that have IRB approval to enter ONLY year of birth, the database will be modified to enter a default of Jan 01 for the month and day of birth, and will allow entry of the year of birth only. All surgical interventions (including lens, corneal and vitreoretinal surgery) and any perioperative complications must be recorded as they occur. The recording of outcomes: IOP control with or without medication and visual acuity will be requested by a reminder email every 6 months. Data will only be recorded in the database: (i) at the time of diagnosis, (ii) with any surgical intervention and complications as they occur and iii) with outcomes (IOP and VA) every six months. Outcomes data will be recorded at 6-month intervals up to 18 months. Centers with IRB approval to do so will have the

option to continue to record outcomes data beyond the initial 18-month period.

This study does not include any recommendations for follow-up or management. Management and visits should occur as part of standard patient care, as determined by each investigator.

The IPSOCG Protocol Committee will not be conducting any site monitoring other than the tracking of the completion of the annual outcome data. Random chart audits may be conducted by an independent Data Quality Committee to validate diagnosis and data integrity. Completion of test cases will be required to ensure consistency

Database

The online data collection software is open source and licence free, and was developed by Mr. Bill Aylward. It was funded by the OpenEyes Project supported in part by Moorfields Special Trustees and the National Institute for Health Research (NIHR) Biomedical Research Centre at Moorfields Eye Hospital. It is hoped that the dataset will not only be used for outcome analysis but can form the basis of personal clinical audit, revalidation and further research that will influence clinical care on an international basis.

Confidentiality

A universally unique identifier (UUID) will be generated for each patient and recorded in the patient's hospital notes or EMR. This will be the only link between the UUID and the patient, meaning that there is no mechanism for a third party who gains possession of the data to identify the patient. The UUID will allow the entry of follow up data for the appropriate patient. Only the unique ID identifies patient data.

All data and other information sent to Glaucoma Research Network (GRN) - which serves as the coordinating center for the project - will be identified using this unique ID number.

In addition, to help identify the study subject, the informed consent form and the assent form (if applicable) will include permission for the GRN Coordinating Center to receive the patient's initials (first, middle, and last name initial).

The registry website is password-protected and restricted to users who have been authorized by the Coordinating Center to gain access. No identifiable health information of an enrolled participant will be released by the GRN Coordinating Center.

Data will be entered on a secure website through an SSL encrypted connection and stored in a secure SQL-server database.

Data access

The survey website will be password-protected and restricted to users who have been invited and authorized by CGRN (i.e., participating investigators) to gain access. Each investigator will be requested to register on the survey website with details of their name, email address and care center.

Each investigator will set their own username and provide an email address of their choice. Login with a username alone will allow users to compare their results with

the pooled data. Email addresses will be used for contact from the Coordinating Center with notifications. Individual investigators will only have access to their own data and to their own results. It will not be possible to view the individual results of other investigators. Tabulations or listings which may reveal the identity of individual study participants are strictly confidential.

Data storage
Glaucoma Research Network (GRN) Coordinating center, Wilmer Eye Institute.

Data Analysis
Bascom Palmer will provide biostatistical support for the study. To eliminate the possibility of the same patient being enrolled twice, patients identified to have the same month and year of birth, will be brought to the attention of the investigators involved to determine if the patients are the same.

Study funding
Currently, no funding is available to assist with data entry and IRB approval costs.

Study results
Survey results will be made available to the investigators and CGRN members through meetings, presentations and the GL foundation website.

PSOCG Protocol committee
This committee will oversee all aspects of the survey including analysis. The survey results will be the intellectual property of CGRN. Any manuscript that may result from the study will be submitted to the Executive Committee for approval prior to submission for publication. Only investigators who have enrolled subjects will be included in publications.

Appendix A

Definition of Childhood

Based on national criteria: < 18 years of age (U.S.A.); ≤ 16 years of age (U.K., Europe)

Definition of Glaucoma (2 or more required)

- ☒ IOP > 21mmHg (investigator discretion if examination under anesthesia data alone due to the variable effects of anesthesia on all methods of IOP assessment),
- ☒ Optic disc cupping: a progressive increase in cup-disc ratio, cup-disc asymmetry of ≥ 0.2 when the optic discs are of similar size, or focal rim thinning,
- ☒ Corneal findings: Haab striae/corneal edema or diameter ≥ 11mm in newborn, > 12 mm in child < 1 year of age, > 13 mm any age,
- ☒ Progressive myopia or myopic shift coupled with an increase in ocular dimensions out of keeping with normal growth,
- ☒ A reproducible visual field defect that is consistent with glaucomatous optic neuropathy with no other observable reason for the visual field defect.

Appendix B

Classification of Childhood Glaucoma

Primary congenital glaucoma (PCG)

i) Isolated angle anomalies (+/- mild congenital iris anomalies)
ii) Meets glaucoma definition (usually with ocular enlargement)
iii) Subcategories based on age of onset
  (1) Neonatal or newborn onset (0-1 month)
  (2) Infantile onset (>1-24 months)
  (3) Juvenile onset or late-recognized (>2 years)

Juvenile open angle glaucoma (JOAG)

i) No ocular enlargement
ii) No congenital ocular anomalies or syndromes
iii) Open angle (normal appearance)
iv) Meets glaucoma definition

Glaucoma associated with ocular anomalies

i) Meets glaucoma definition
ii) List ocular anomalies (i.e. aniridia, sclerocornea, Axenfeld-Rieger anomaly, etc)

Glaucoma associated with systemic disease or syndrome

i) Meets glaucoma definition
ii) List systemic syndrome or disease (i.e. Sturge-Weber {complete – facial and leptomeningeal hemangioma, incomplete – either type of hemangioma}, Trisomy 13, Marfan, etc.

Glaucoma associated with acquired condition

i) Meets glaucoma definition after the acquired condition is recognized
ii) List acquired condition (trauma, uveitis, infection, corticosteroid- induced, etc)
iii) Gonioscopy results if available
  (a) Open angle glaucoma (> / = 50% open) or
  (b) Angle closure glaucoma (< 50% open or acute angle closure)

Glaucoma Following Cataract Surgery

☒ Meets glaucoma definition **after** cataract surgery is performed and sub-divided into three categories:
  (1) Congenital idiopathic cataract
  (2) Congenital cataract associated with ocular anomalies / systemic disease (no previous glaucoma)
  (3) Acquired cataract (no previous glaucoma)

☒ Based on gonioscopy results:
  (1) Open angle glaucoma (> / = 50% open) or
  (2) Angle closure glaucoma (< 50% open or acute angle closure)

Appendix C

IPSOCG Participating Centers – Phase I

US

1. Allen D. Beck	Emory Eye Center, Emory University School of Medicine
2. James D. Brandt	University of California, Davis Eye Center
3. Anne L. Coleman	Jules Stein Eye Institute
4. Sharon F. Freedman	Duke Eye Center
5. Alana L. Grajewski	University of Minnesota
6. Peter Chang Elizabeth Hodapp Mark Werner	Bascom Palmer Eye Institute
7. Alex V. Levin	Wills Eye Institute
8. Douglas J. Rhee	Harvard Medical School
9. Ken K. Nischal	University of Pittsburgh School of Medicine

Europe

10. Peng T Khaw Maria Papadopoulos John Brookes	Moorfields Eye Centre, London, England
11. Velota Sung	Birmingham and Midland Eye Centre, England
12. Franz Grehn Thomas Klink	University Hospitals, Würzburg, Germany

Asia

13. Anil Mandal Sirisha Senthil	L V Prasad Eye Institute, Hyderabad
14. Arif Khan	King Khaled Eye Specialist Hospital, Riyadh, Saudi Arabia
15. Ching Lin Ho	Singapore National Eye Centre

Australia

16. John Grigg	Sydney Eye Hospital, The Children's Hospital, Westmead

IPSOCG Participating Centers – Phase II

North America (United States and Canada)

18. Douglas J. Rhee	Case Western
19. Beth Edmunds	Casey Eye, Oregon
20. Lauren Blieden	University of Texas
21. Kamiar Mireskandari Asim Ali Nasrin Tehrani	University of Toronto, Hospital for Sick Children
22. Shira Robbins	University of California, San Diego
23. Anya Trumler	Wilmer

Europe (United Kingdom, Denmark, France)

24. Manoj Parulekar Joe Abbott	Birmingham Children's Hospital
25. Ceclia Fenerty	Manchester
26. John Thygesen Daniella Bach-Holm	Copenhagen University Hospital, Glostrup, Denmark
27. Julián Garcia Feijoo	Madrid

South Asia

28. Suman S. Thapa	Tilganga Institute of Ophthalmology, Kathmandu, Nepal
29. Manju Anilkumar	Aravind Eye Centre, India
30. Tanuj Dada	New Delhi, India

Africa

31. Nicola Freeman	Univ of Stellenbosch and Tygerberg Academic Hospital, Cape Town, South Africa
32. Vera Essuman	Ghana

South America

33. Oscar Albis-Donado	Mexico

Australia

34. Jonathan Ruddle	Royal Children's Hospital, Melbourne