Pediatric ERCP in the Setting of Acute Pancreatitis

A Report from the Multicenter Pediatric ERCP Database Initiative (PEDI)

UT Southwestern **Children's Health CMC** • David Troendle (PI) • Bradley Barth • Josh Carroll • Carolyn Kelly	**University of Southern California** **Children's Hospital of Los Angeles** • Quin Liu (PI) • Arathi Lakhole	**Baylor College of Medicine** **Texas Children's Hospital** • Doug Fishman (PI) • Cynthia Tsai
Asan Medical Center **Asan Children's Hospital** • Kyung Mo Kim (PI)	**University of Washington** **Seattle Children's Hospital** • Matthew Giefer (PI)	**Columbia University** **Morgan Stanley Children's Hospital** • Mercedes Martinez (PI)
John Hopkins School of Medicine **All Children's Hospital** • Michael Wilsey (PI) • Racha Khalaf	**North Shore LIJ** **Cohen Children's Medical Center** • Samuel Bitton (PI)	**Medical College of Wisconsin** **Children's Hospital of Wisconsin** • Steven Werlin (PI) • Diana Lerner • Kulwinder Dua • Rachel Unteutsch

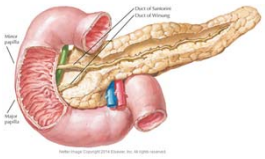
NASPGHAN 2015
10/10/2015

UT Southwestern Medical Center

children's health Children's Medical Center

Background

- ERCP is an an endoscopic modality which allows for diagnostic and therapeutic maneuvers to take place within the biliary tree and pancreatic ductal systems.
- It is a commonly held belief that ERCP should be avoided during episodes of acute pancreatitis
- Acute pancreatitis in children is not uncommon and can occur secondary to etiologies treatable by ERCP.



UT Southwestern Medical Center

children's health Children's Medical Center

Specific Aim

- Determine if the presence of acute pancreatitis at the time of the procedure influences procedural outcomes in pediatric ERCP?
- To achieve this aim:
  - Utilized the PEDI database to compare procedure outcomes and adverse events for patients with and without pancreatitis at the time of ERCP.

UT Southwestern Medical Center

children's health Children's Medical Center

Methods

- PEDI Database
  - An ongoing multicenter longitudinal database.
  - 9 IRB approved sites currently entering consecutive ERCPs in children.
  - Data collection began on 5/2014 and is ongoing.
  - ERCPs performed through 9/2015 were included.
- Data Collected (REDCap database)
  - Pre-procedural form
  - Procedural form
  - 2 week F/U form
  - Adverse event form

UT Southwestern Medical Center

children's health Children's Medical Center

Methods

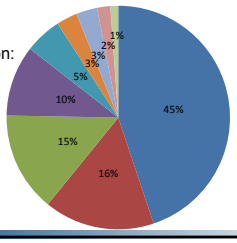
- Two groups:
  - **Pre-ERCP pancreatitis**
    - Defined as pancreatitis within 7 days of ERCP.
    - Peak amylase and lipase values provided to confirm diagnosis.
  - **No Pre-ERCP pancreatitis**
- Groups were compared utilizing standard statistical methods
  - Student T test for continuous variables
  - Fischer's exact and Chi square test for categorical variables

UT Southwestern Medical Center

children's health Children's Medical Center

Data

- **258** consecutive ERCPs from 9 centers over a 16 month period.
- All four forms were filled out for each procedure.
- Center Participation:



UT Southwestern Medical Center

children's health Children's Medical Center

Data

- **40 (16%)** in the pre-ERCP AP group.
- **218 (84%)** in the no pre-ERCP AP group.

UT Southwestern Medical Center

children's health Children's Medical Center

Data: Patient Characteristics

Characteristic	N (%)
N	258
Mean age, yrs (range)	11.9 (0.2-18.9)
Mean wt, kg (range)	48.8 (4.1-146.1)

UT Southwestern Medical Center

children's health Children's Medical Center

Data: Patient Characteristics

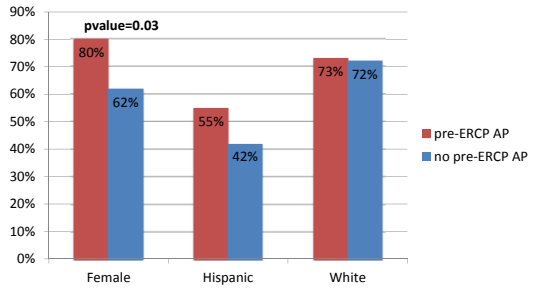
Characteristic	pre-ERCP AP N (%)	No pre-ERCP AP N (%)	P value
N	40	218	
Mean age, yrs (range)	11.9 (2.6-18.1)	11.9 (0.2-18.9)	0.97
Mean wt, kg (range)	46.9 (11.8-141.6)	49.1 (4.0-146.1)	0.61

UT Southwestern Medical Center

* Significant by Fisher's exact test

children's health Children's Medical Center

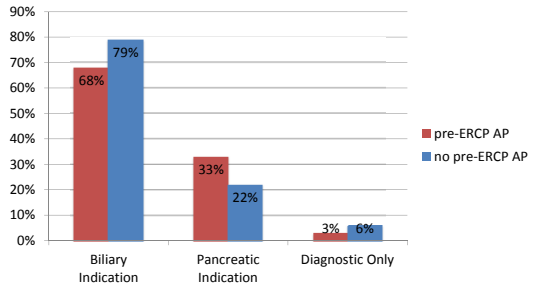
Patient Characteristics



UT Southwestern Medical Center

children's health Children's Medical Center

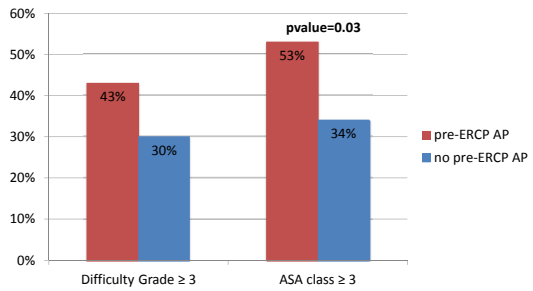
Pre-procedural Defined Indications



UT Southwestern Medical Center

children's health Children's Medical Center

Pre-procedural Characteristics

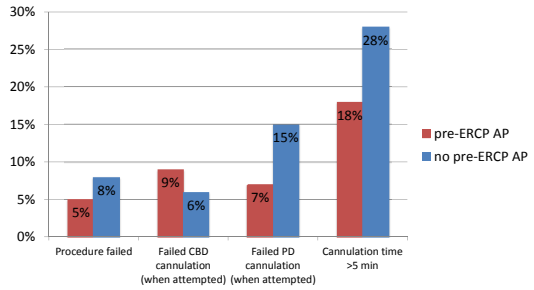


UT Southwestern Medical Center

1. Cotton et al. ASGE. 2010

children's health Children's Medical Center

Procedural Characteristics



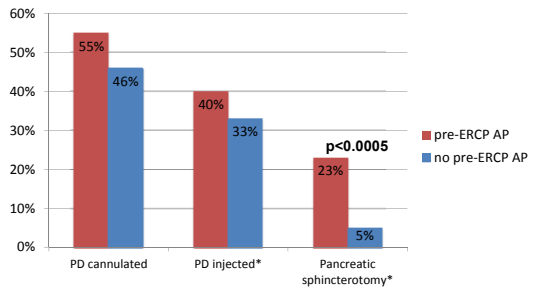
UT Southwestern Medical Center

children's health Children's Medical Center

Procedural Characteristics

Criteria	pre-ERCP AP min (range)	No pre-ERCP AP min (range)	P value
Mean Procedure Time	43 (13-120)	43 (5.9-241)	0.91

Procedural Characteristics



* Identified to be risk factors for post-procedural pancreatitis in pediatric patients.[2,3]

2. Troendle et al. Gastrointest Endosc. 2015

3. Giefer et al. Surg Endosc. 2015

UT Southwestern Medical Center

children's health Children's Medical Center

Adverse Events

- Adverse events[2]: 22 (9%)

Adverse Event	pre-ERCP AP N	No pre-ERCP AP N	P-value
Any	2 (5%)	20 (9%)	0.57
Pancreatitis	0	8 (6 mild/1 mod/1 severe)	
Pain	0	7 (5 mild/1 mod/1 severe)	
Bleeding	1 (severe)	2 (mild)	
Fever	1 (severe)	1 (mild)	
Other	0	1 perforation (severe) 1 cholangitis (mild)	

UT Southwestern Medical Center

2. Lexicon for Endoscopic Adverse Events. ASGE. 2010

children's health Children's Medical Center

Conclusions

- Patients with pre-ERCP pancreatitis were:
  - More likely to be female
  - Had higher ASA scores at the time of procedure
  - Underwent higher risk interventions more frequently
- The presence of pancreatitis at the time of ERCP had no significant effect on:
  - Procedural success
  - Cannulation times
  - Length of procedure
  - Adverse events
- This suggests that pediatric ERCP can be safely and effectively performed in this setting when appropriately indicated.

UT Southwestern Medical Center

children's health Children's Medical Center

Limitations/Future Directions

- Unable to quantify the severity of pancreatitis at the time of ERCP.
- Strong trends that may be fleshed out further with more patients being entered.
- Continuing to expand our efforts with the PEDI database.
  - Up to 12 IRB approved sites from around the globe.

UT Southwestern Medical Center

children's health Children's Medical Center

Thank you!

UT Southwestern **Children's Health CMC** • David Troendle (PI) • Bradley Barth • Josh Carroll • Carolyn Kelly	**University of Southern California** **Children's Hospital of Los Angeles** • Quin Liu (PI) • Arathi Lakhole	**Baylor College of Medicine** **Texas Children's Hospital** • Doug Fishman (PI) • Cynthia Tsai
Asan Medical Center **Asan Children's Hospital** • Kyung Mo Kim (PI)	**University of Washington** **Seattle Children's Hospital** • Matthew Giefer (PI)	**Columbia University** **Morgan Stanley Children's Hospital** • Mercedes Martinez (PI)
John Hopkins School of Medicine **All Children's Hospital** • Michael Wilsey (PI) • Racha Khalaf	**North Shore LIJ** **Cohen Children's Medical Center** • Samuel Bitton (PI)	**Medical College of Wisconsin** **Children's Hospital of Wisconsin** • Steven Werlin (PI) • Diana Lerner • Kulwinder Dua • Rachel Unteutsch

Support:
CTSA NIH Grant UL1-RR024982 (REDCap).

UT Southwestern Medical Center

children's health Children's Medical Center

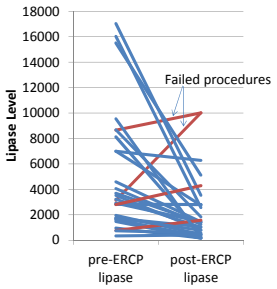
Adverse Event Form

UT Southwestern Medical Center

children's health Children's Medical Center

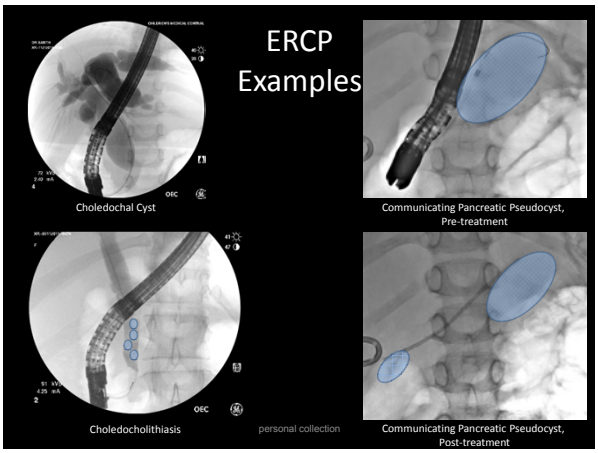
Peak Lipase Levels

- 40 Patients with pre-ERCP pancreatitis
  - 29 had post-ERCP lipase values
  - Only 4 (14%) had increased lipase values following ERCP.



UT Southwestern Medical Center

children's health Children's Medical Center



Data: Patient Characteristics

Characteristic	pre-ERCP AP N (%)	No pre-ERCP AP N (%)	P value
N	40	218	
Mean age, yrs (range)	11.9 (2.6-18.1)	11.9 (0.2-18.9)	0.97
Mean wt, kg (range)	46.9 (11.8-141.6)	49.1 (4.0-146.1)	0.61
Female	**32 (80%)**	**135 (62%)**	**0.03***
Hispanic	22 (55%)	92 (42%)	0.17
White	29 (73%)	156 (72%)	1.00
Asian	4 (10%)	31 (14%)	0.64

UT Southwestern Medical Center

* Significant by Fisher's exact test

children's health Children's Medical Center

Data: Procedural Indications

Indication	N (%)
Biliary	**199 (77%)**
Choledocholithiasis	101 (39%)
Stricture management	51 (20%)
Other biliary	33 (13%)
Diagnostic	14 (5%)
Pancreatic	**61 (24%)**
Treatment of CP	34 (13%)
Treatment of ARP	11 (4%)
Pancreatic duct leaks	6 (2%)
Other pancreatic	9 (3%)
Diagnostic	1 (0%)

UT Southwestern Medical Center

children's health Children's Medical Center

Data: Procedural Characteristics

Criteria	N (%)
Difficulty Grade ≥3	82 (32%)
ASA ≥3	91 (35%)
Cannulation time >5 min	68 (26%)
Mean Procedure time, min (range)	43 (6-241)
Procedure considered failure	20 (8%)
Failed cannulation of CBD (% of attempts)	15 (7%)
Failed cannulation of PD (% of attempts)	10 (15%)

UT Southwestern Medical Center

children's health Children's Medical Center

Data: Procedural Characteristics

Criteria	N (%)
PD cannulated	122 (47%)
PD injected*	89 (34%)
Pancreatic sphincterotomy*	19 (7%)
Post-ERCP pancreatitis ppx Rectal indomethacin Pancreatic stent*	109 (42%) 68 (26%) 12 (5%)

* Identified to be risk factors for post-procedural pancreatitis in pediatric patients.[2,3]

UT Southwestern Medical Center

2. Troendle et al. Gastrointest Endosc. 2015
3. Giefer et al. Surg Endosc. 2015

children's health Children's Medical Center

Data: Procedural Indications

Indication	pre-ERCP AP N (%)	No pre-ERCP AP N (%)	P value
Biliary	**27 (68%)**	**172 (79%)**	0.15
Choledocholithiasis	16 (40%)	85 (39%)	1.00
Stricture management	4 (10%)	47 (22%)	0.14
Other biliary	6 (15%)	27 (12%)	0.84
Diagnostic	1 (3%)	13 (6%)	0.61
Pancreatic	**13 (33%)**	**48 (22%)**	0.16
Treatment of CP	5 (13%)	29 (13%)	0.89
Treatment of ARP	2 (5%)	9 (4%)	0.80
Pancreatic duct leaks	3 (8%)	3 (1%)	0.07
Other pancreatic	3 (8%)	6 (3%)	0.30
Diagnostic	0 (0%)	1 (0%)	1.00

UT Southwestern Medical Center

children's health Children's Medical Center

Data: Procedural Characteristics

Criteria	pre-ERCP AP N (%)	No pre-ERCP AP N (%)	P value
PD cannulated	22 (55%)	100 (46%)	0.31
PD injected*	16 (40%)	73 (33%)	0.47
Pancreatic sphincterotomy*	**9 (23%)**	**10 (5%)**	**<0.0005***
Post-ERCP pancreatitis ppx Rectal indomethacin **Pancreatic stent***	16 (40%) 9 (23%) **7 (18%)**	91 (42%) 59 (27%) **4 (2%)**	0.86 0.68 **<0.01***

- Conclusion: Patients with pre-ERCP pancreatitis were more likely to be exposed to risk factors associated with post-ERCP pancreatitis (pancreatic sphincterotomy, ppx pancreatic stent placement)

UT Southwestern Medical Center

* Significant by Chi square test

children's health Children's Medical Center

Data: Procedural Characteristics

Criteria	pre-ERCP AP N (%)	No pre-ERCP AP N (%)	P value
Difficulty Grade[1] ≥3	17 (43%)	65 (30%)	0.14
ASA ≥3	**21 (53%)**	**74 (34%)**	**0.03***
Procedure considered failure	2 (5%)	18 (8%)	0.70
Failed cannulation of CBD (% of attempts)	3 (9%)	12 (6%)	0.90
Failed cannulation of PD (% of attempts)	1 (7%)	9 (15%)	0.96
Cannulation time >5 min	7 (18%)	61 (28%)	0.23
Mean Procedure time, min (range)	43 (13-120)	43 (5.9-241)	0.91
Length of stay, days (range)	9.3 (1-53)	5.3 (0-168)	0.15

UT Southwestern Medical Center

children's health Children's Medical Center