Early Clinical Experience Scholarly Project:

Students learn from patients and clinics learn from students

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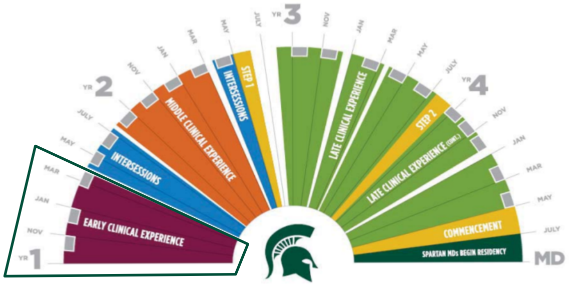
Preparing today's learners for tomorrow's practice

Overview

- Context:
  - The Shared Discovery Curriculum
  - The Early Clinical Experience (ECE)
- The Problem
- Project Implementation
- Next Steps
- Interactive Poster Review
- Potential Applications at Other Institutions
- Q&A

Introduction to the Shared Discovery Curriculum



Early Clinical Experience (1 of 2)

SHARED DISCOVERY CURRICULUM

- 1st 24 weeks of medical school:
  - 8 week preparatory experience
    - To be safe and helpful
  - 16 week longitudinal ambulatory experience
- Work with the health care team
  - Medical assistants, nurses, office staff, physicians, etc.
- Perform clinical tasks
  - Vitals, med rec, point-of-care testing
- See and learn from patients
  - Medical diagnoses, medications, social context, etc.
- Discuss experiences in Post Clinic Groups twice weekly

Early Clinical Experience (2 of 2)

SHARED DISCOVERY CURRICULUM

- Other activities include:
  - Weekend learning module
  - Large group activity
  - Post clinic groups
  - Gross anatomy lab
  - Virtual imaging and physiology lab
  - Simulation
  - Clinic (Early Clinical Experience)
  - Guided independent learning
  - Weekly formative assessments
- Preparation is key for active learning
- In-class experiences utilize flipped classroom methodologies

A Missing Piece?

The ECE Scholarly Project: The Problem

- A way for students to delve deeper into questions raised in their clinical settings, but...

- Inherent challenges with a short timeline
  - Complete a meaningful project in 2-3 months
- Preceptors with varying levels of interest
  - Students placed at >100 ambulatory clinical sites
- First-year medical students
  - Some without project or presentation experience

- ...and they're still in a rigorous medical school curriculum!

The ECE Scholarly Project: Implementation

Students start in clinic	Week 9	
	Week 10	
	Week 11	
Checklist	Week 12	
	Week 13	Proposal writing workshop
One page proposal	Week 15	
	Week 16	Proposal feedback
	Holiday break	
	Week 17	Quantitative and qualitative data analysis modules
	Week 18	
	Week 19	
	Week 20	Office hours: Data analysis and poster preparation
	Week 21	
Poster submissions	Week 22	
	Week 23	
Poster presentations	Week 24	

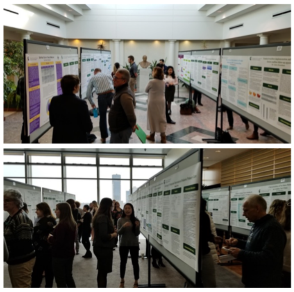
Poster Presentations

Methodologies

- Quality Improvement (QI)
- Patient Education
- Literature Review
- Case Presentation

Topics

- Diabetes
- Immunizations
- Mental health/Screening
- Hypertension
- Handwashing
- No shows, patient portal, scheduling, wait time, team dynamics, patient satisfaction
- Language/interpreters
- Opioids



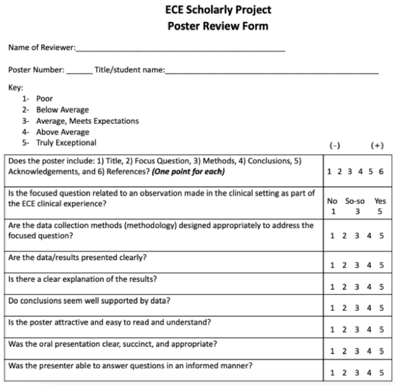
The ECE Scholarly Project: Unanticipated Challenges

- Everyone thought they needed to do a QI project
  - Maybe because of discussing QI vs. Research?
  - A lot of faculty effort to ensure QI projects were appropriate
- Many students wanted to survey patients
  - Required a clearcut QI format
  - Will not be allowed in 2nd iteration -- ultimately for protection of patients, also to reduce stress on faculty
- Students with previous research experience felt limited in scope
  - Option to take their project further in MCE or LCE

Next Steps

	Prior to week 8	Information available online
	Week 8	Orientation
Students start in clinic	Week 9	
	Week 10	
Checklist	Week 11	Workshop: define your focus question
	Week 12	
One page proposal	Week 13	
	Week 15	Proposal feedback
Revised proposals	Week 16	
	Holiday break	Quantitative and qualitative data analysis modules (available prior to week 8)
	Week 17	
	Week 18	
	Week 19	Office hours: Data analysis and poster preparation
	Week 20	
	Week 21	
Poster submissions	Week 22	
	Week 23	
Poster presentations	Week 24	

Interactive Poster Review



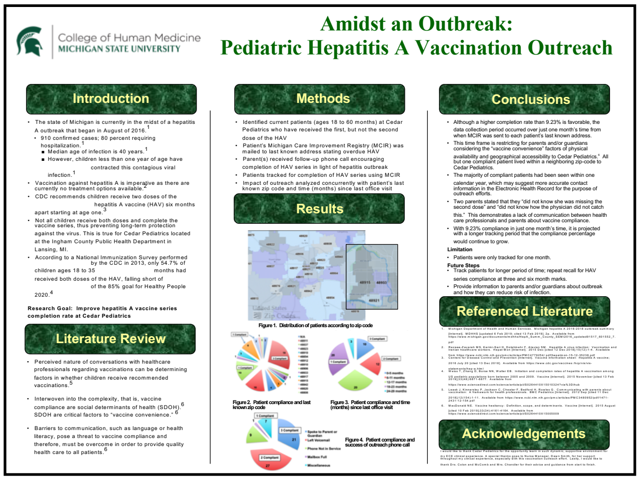
ECE Scholarly Project
Poster Review Form

Name of Reviewer:____

Poster Number: ______ Title/student name:____

Key:
1- Poor
2- Below Average
3- Average, Meets Expectations
4- Above Average
5- Truly Exceptional

	(-) (+)
Does the poster include: 1) Title, 2) Focus Question, 3) Methods, 4) Conclusions, 5) Acknowledgements, and 6) References? ***(One point for each)***	1 2 3 4 5 6
Is the focused question related to an observation made in the clinical setting as part of the ECE clinical experience?	No 1 So-so 3 Yes 5
Are the data collection methods (methodology) designed appropriately to address the focused question?	1 2 3 4 5
Are the data/results presented clearly?	1 2 3 4 5
Is there a clear explanation of the results?	1 2 3 4 5
Do conclusions seem well supported by data?	1 2 3 4 5
Is the poster attractive and easy to read and understand?	1 2 3 4 5
Was the oral presentation clear, succinct, and appropriate?	1 2 3 4 5
Was the presenter able to answer questions in an informed manner?	1 2 3 4 5



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Amidst an Outbreak: Pediatric Hepatitis A Vaccination Outreach

Introduction

- The state of Michigan is currently in the midst of a hepatitis A outbreak that began in August of 2016.[1]
  - 910 confirmed cases; 80 percent requiring hospitalization.[1]
    - Median age of infection is 40 years.[1]
    - However, children less than one year of age have contracted this contagious viral infection.[1]
- Vaccination against hepatitis A is imperative as there are currently no treatment options available.[2]
- CDC recommends children receive two doses of the hepatitis A vaccine (HAV) six months apart starting at age one.[3]
- Not all children receive both doses and complete the vaccine series, thus preventing long-term protection against the virus. This is true for Cedar Pediatrics located at the Ingham County Public Health Department in Lansing, MI.
- According to a National Immunization Survey performed by the CDC in 2013, only 54.7% of children ages 18 to 35 months had received both doses of the HAV, falling short of of the 85% goal for Healthy People 2020.[4]

Research Goal: Improve hepatitis A vaccine series completion rate at Cedar Pediatrics

Literature Review

- Perceived nature of conversations with healthcare professionals regarding vaccinations can be determining factors in whether children receive recommended vaccinations.[5]
- Interwoven into the complexity, that is, vaccine compliance are social determinants of health (SDOH).[6] SDOH are critical factors to "vaccine convenience." [6]
- Barriers to communication, such as language or health literacy, pose a threat to vaccine compliance and therefore, must be overcome in order to provide quality health care to all patients.[6]

Methods

- Identified current patients (ages 18 to 60 months) at Cedar Pediatrics who have received the first, but not the second dose of the HAV
- Patient's Michigan Care Improvement Registry (MCIR) was mailed to last known address stating overdue HAV
- Parent(s) received follow-up phone call encouraging completion of HAV series in light of hepatitis outbreak
- Patients tracked for completion of HAV series using MCIR
- Impact of outreach analyzed concurrently with patient's last known zip code and time (months) since last office visit

Results

Figure 1. Distribution of patients according to zip code

Figure 2. Patient compliance and last known zip code

Figure 3. Patient compliance and time (months) since last office visit

Figure 4. Patient compliance and success of outreach phone call

Conclusions

- Although a higher completion rate than 9.23% is favorable, the data collection period occurred over just one month's time from when MCIR was sent to each patient's last known address.
- This time frame is restricting for parents and/or guardians considering the "vaccine convenience" factors of physical availability and geographical accessibility to Cedar Pediatrics.[6] All but one compliant patient lived within a neighboring zip-code to Cedar Pediatrics.
- The majority of compliant patients had been seen within one calendar year, which may suggest more accurate contact information in the Electronic Health Record for the purpose of outreach efforts.
- Two parents stated that they "did not know she was missing the second dose" and "did not know how the physician did not catch this." This demonstrates a lack of communication between health care professionals and parents about vaccine compliance.
- With 9.23% compliance in just one month's time, it is projected with a longer tracking period that the compliance percentage would continue to grow.

Limitation

- Patients were only tracked for one month.

Future Steps

- Track patients for longer period of time; repeat recall for HAV series compliance at three and six month marks.
- Provide information to parents and/or guardians about outbreak and how they can reduce risk of infection.

Referenced Literature

1. Michigan Department of Health and Human Services. Michigan hepatitis A 2016-2018 outbreak summary [Internet]. MDHHS [updated 6 Feb 2019; cited 13 Feb 2019]. 2p. Available from https://www.michigan.gov/documents/mdhhs/HepA_Summ_County_SEMI2016_updated91517_601552_7.pdf
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Acknowledgements

I would like to thank Cedar Pediatrics for the opportunity learn in such dynamic, supportive environment for my ECE clinical experience. A special thanks goes to Nurse Manager, Dawn Smith, for her support throughout my clinical experience, especially with this vaccination outreach effort. Lastly, I would like to thank Drs. Colon and McComb and Mrs. Chandler for their advice and guidance from start to finish.

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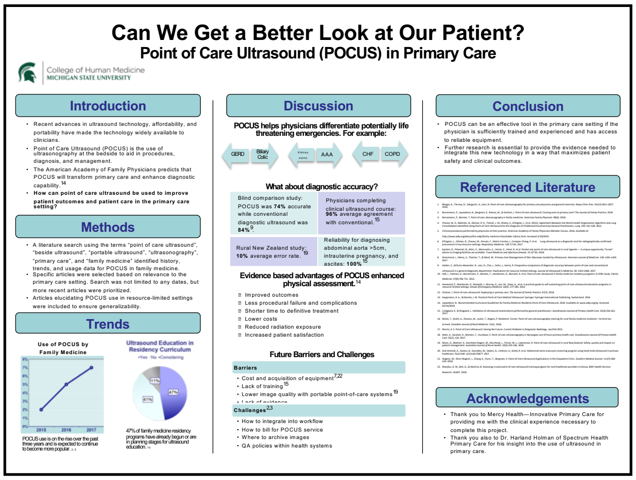

Can We Get a Better Look at Our Patient?

Point of Care Ultrasound (POCUS) in Primary Care

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Introduction

- Recent advances in ultrasound technology, affordability, and portability have made the technology widely available to clinicians.
- Point of Care Ultrasound (POCUS) is the use of ultrasonography at the bedside to aid in procedures, diagnosis, and management.
- The American Academy of Family Physicians predicts that POCUS will transform primary care and enhance diagnostic capability.[14]
- **How can point of care ultrasound be used to improve patient outcomes and patient care in the primary care setting?**

Methods

- A literature search using the terms "point of care ultrasound", "beside ultrasound", "portable ultrasound", "ultrasonography", "primary care", and "family medicine" identified history, trends, and usage data for POCUS in family medicine.
- Specific articles were selected based on relevance to the primary care setting. Search was not limited to any dates, but more recent articles were prioritized.
- Articles elucidating POCUS use in resource-limited settings were included to ensure generalizability.

Trends

Use of POCUS by Family Medicine

POCUS use is on the rise over the past three years and is expected to continue to become more popular.[2,5]

Ultrasound Education in Residency Curriculum

47% of family medicine residency programs have already begun or are in planning stages for ultrasound education.[10]

Discussion

POCUS helps physicians differentiate potentially life threatening emergencies. For example:

GERD ⟷ Biliary Colic

Kidney stone ⟷ AAA

CHF ⟷ COPD

What about diagnostic accuracy?

Blind comparison study: POCUS was **74%** accurate while conventional diagnostic ultrasound was **84%**[9].	Physicians completing clinical ultrasound course: **96%** average agreement with conventional.[15]
Rural New Zealand study: **10%** average error rate.[19]	Reliability for diagnosing abdominal aorta >5cm, intrauterine pregnancy, and ascites: **100%**[15]

Evidence based advantages of POCUS enhanced physical assessment.[14]

- Improved outcomes
- Less procedural failure and complications
- Shorter time to definitive treatment
- Lower costs
- Reduced radiation exposure
- Increased patient satisfaction

Future Barriers and Challenges

Barriers

- Cost and acquisition of equipment[7,22]
- Lack of training[15]
- Lower image quality with portable point-of-care systems[19]
- Lack of evidence

Challenges[2,3]

- How to integrate into workflow
- How to bill for POCUS service
- Where to archive images
- QA policies within health systems

Conclusion

- POCUS can be an effective tool in the primary care setting if the physician is sufficiently trained and experienced and has access to reliable equipment.
- Further research is essential to provide the evidence needed to integrate this new technology in a way that maximizes patient safety and clinical outcomes.

Referenced Literature

Acknowledgements

- Thank you to Mercy Health—Innovative Primary Care for providing me with the clinical experience necessary to complete this project.
- Thank you also to Dr. Harland Holman of Spectrum Health Primary Care for his insight into the use of ultrasound in primary care.

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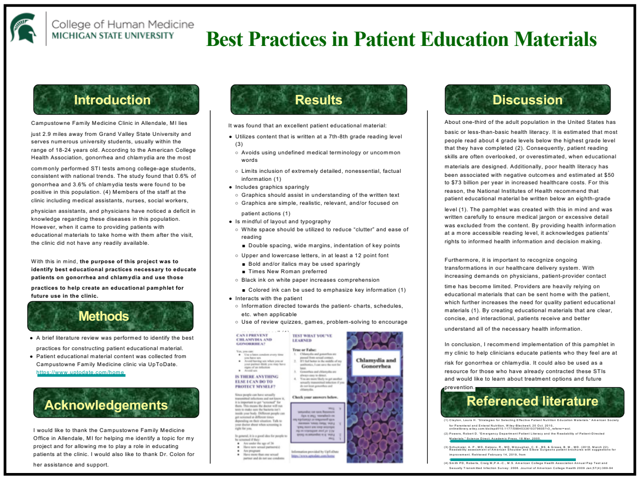

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Best Practices in Patient Education Materials

Introduction

Campustowne Family Medicine Clinic in Allendale, MI lies just 2.9 miles away from Grand Valley State University and serves numerous university students, usually within the range of 18-24 years old. According to the American College Health Association, gonorrhea and chlamydia are the most commonly performed STI tests among college-age students, consistent with national trends. The study found that 0.6% of gonorrhea and 3.6% of chlamydia tests were found to be positive in this population. (4) Members of the staff at the clinic including medical assistants, nurses, social workers, physician assistants, and physicians have noticed a deficit in knowledge regarding these diseases in this population. However, when it came to providing patients with educational materials to take home with them after the visit, the clinic did not have any readily available.

With this in mind, **the purpose of this project was to identify best educational practices necessary to educate patients on gonorrhea and chlamydia and use those practices to help create an educational pamphlet for future use in the clinic.**

Methods

- A brief literature review was performed to identify the best practices for constructing patient educational material.
- Patient educational material content was collected from Campustowne Family Medicine clinic via UpToDate. https://www.uptodate.com/home

Acknowledgements

I would like to thank the Campustowne Family Medicine Office in Allendale, MI for helping me identify a topic for my project and for allowing me to play a role in educating patients at the clinic. I would also like to thank Dr. Colon for her assistance and support.

Results

It was found that an excellent patient educational material:

- Utilizes content that is written at a 7th-8th grade reading level (3)
  - Avoids using undefined medical terminology or uncommon words
  - Limits inclusion of extremely detailed, nonessential, factual information (1)
- Includes graphics sparingly
  - Graphics should assist in understanding of the written text
  - Graphics are simple, realistic, relevant, and/or focused on patient actions (1)
- Is mindful of layout and typography
  - White space should be utilized to reduce "clutter" and ease of reading
    - Double spacing, wide margins, indentation of key points
  - Upper and lowercase letters, in at least a 12 point font
    - Bold and/or italics may be used sparingly
    - Times New Roman preferred
  - Black ink on white paper increases comprehension
    - Colored ink can be used to emphasize key information (1)
- Interacts with the patient
  - Information directed towards the patient- charts, schedules, etc. when applicable
  - Use of review quizzes, games, problem-solving to encourage memory recall (1)

CAN I PREVENT CHLAMYDIA AND GONORRHEA?

Yes, you can:

- Use a latex condom every time you have sex
- Avoid having sex when you or your partner think you may have signs of an infection
- Avoid sex

IS THERE ANYTHING ELSE I CAN DO TO PROTECT MYSELF?

Since people can have sexually transmitted infections and not know it, it is important to get "screened" for them. This means the doctor will run tests to make sure the bacteria isn't inside your body. Different people can get screened at different times depending on their situation. Talk to your doctor about when screening is right for you.

In general, it is a good idea for people to be screened if they:

- Are under the age of 26
- Have new sexual partner(s)
- Are pregnant
- Have more than one sexual partner and do not use condoms

TEST WHAT YOU'VE LEARNED

True or False:

1. Chlamydia and gonorrhea are passed from sexual contact.
2. If I feel better in the middle of my antibiotics, I can save the rest for later.
3. Gonorrhea and chlamydia are always easy to detect.
4. You are more likely to get another sexually transmitted infection if you do not treat gonorrhea and chlamydia.

Check your answers below.

Information provided by UpToDate
https://www.uptodate.com/home

Chlamydia and Gonorrhea

Discussion

About one-third of the adult population in the United States has basic or less-than-basic health literacy. It is estimated that most people read about 4 grade levels below the highest grade level that they have completed (2). Consequently, patient reading skills are often overlooked, or overestimated, when educational materials are designed. Additionally, poor health literacy has been associated with negative outcomes and estimated at $50 to $73 billion per year in increased healthcare costs. For this reason, the National Institutes of Health recommend that patient educational material be written below an eighth-grade level (1). The pamphlet was created with this in mind and was written carefully to ensure medical jargon or excessive detail was excluded from the content. By providing health information at a more accessible reading level, it acknowledges patients' rights to informed health information and decision making.

Furthermore, it is important to recognize ongoing transformations in our healthcare delivery system. With increasing demands on physicians, patient-provider contact time has become limited. Providers are heavily relying on educational materials that can be sent home with the patient, which further increases the need for quality patient educational materials (1). By creating educational materials that are clear, concise, and interactional, patients receive and better understand all of the necessary health information.

In conclusion, I recommend implementation of this pamphlet in my clinic to help clinicians educate patients who they feel are at risk for gonorrhea or chlamydia. It could also be used as a resource for those who have already contracted these STIs and would like to learn about treatment options and future prevention.

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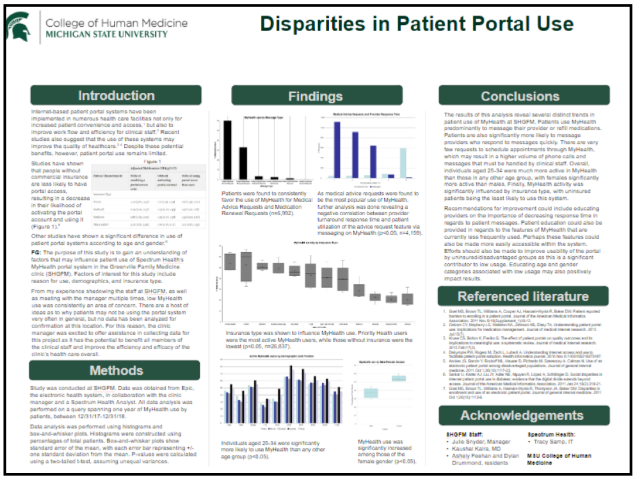

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Disparities in Patient Portal Use

Introduction

Internet-based patient portal systems have been implemented in numerous health care facilities not only for increased patient convenience and access,[1] but also to improve work flow and efficiency for clinical staff.[2] Recent studies also suggest that the use of these systems may improve the quality of healthcare.[3,4] Despite these potential benefits, however, patient portal use remains limited.

Studies have shown that people without commercial insurance are less likely to have portal access, resulting in a decrease in their likelihood of activating the portal account and using it (Figure 1).[5]

Figure 1

Other studies have shown a significant difference in use of patient portal systems according to age and gender.[6]

FQ: The purpose of this study is to gain an understanding of factors that may influence patient use of Spectrum Health's MyHealth portal system in the Greenville Family Medicine clinic (SHGFM). Factors of interest for this study include reason for use, demographics, and insurance type.

From my experience shadowing the staff at SHGFM, as well as meeting with the manager multiple times, low MyHealth use was consistently an area of concern. There are a host of ideas as to why patients may not be using the portal system very often in general, but no data has been analyzed for confirmation at this location. For this reason, the clinic manager was excited to offer assistance in collecting data for this project as it has the potential to benefit all members of the clinical staff and improve the efficiency and efficacy of the clinic's health care overall.

Methods

Study was conducted at SHGFM. Data was obtained from Epic, the electronic health system, in collaboration with the clinic manager and a Spectrum Health Analyst. All data analysis was performed on a query spanning one year of MyHealth use by patients, between 12/31/17-12/31/18.

Data analysis was performed using histograms and box-and-whisker plots. Histograms were constructed using percentages of total patients. Box-and-whisker plots show standard error of the mean, with each error bar representing +/- one standard deviation from the mean. P-values were calculated using a two-tailed t-test, assuming unequal variances.

Findings

Patients were found to consistently favor the use of MyHealth for Medical Advice Requests and Medication Renewal Requests (n=6,992).

As medical advice requests were found to be the most popular use of MyHealth, further analysis was done revealing a negative correlation between provider turnaround response time and patient utilization of the advice request feature via messaging on MyHealth (p<0.05, n=4,159).

Insurance type was shown to influence MyHealth use. Priority Health users were the most active MyHealth users, while those without insurance were the lowest (p<0.05, n=26,837).

Individuals aged 25-34 were significantly more likely to use MyHealth than any other age group (p<0.05).

MyHealth use was significantly increased among those of the female gender (p<0.05).

Conclusions

The results of this analysis reveal several distinct trends in patient use of MyHealth at SHGFM. Patients use MyHealth predominantly to message their provider or refill medications. Patients are also significantly more likely to message providers who respond to messages quickly. There are very few requests to schedule appointments through MyHealth, which may result in a higher volume of phone calls and messages that must be handled by clinical staff. Overall, individuals aged 25-34 were much more active in MyHealth than those in any other age group, with females significantly more active than males. Finally, MyHealth activity was significantly influenced by insurance type, with uninsured patients being the least likely to use this system.

Recommendations for improvement could include educating providers on the importance of decreasing response time in regards to patient messages. Patient education could also be provided in regards to the features of MyHealth that are currently less frequently used. Perhaps these features could also be made more easily accessible within the system. Efforts should also be made to improve usability of the portal by uninsured/disadvantaged groups as this is a significant contributor to low usage. Educating age and gender categories associated with low usage may also positively impact results.

Referenced literature

Acknowledgements

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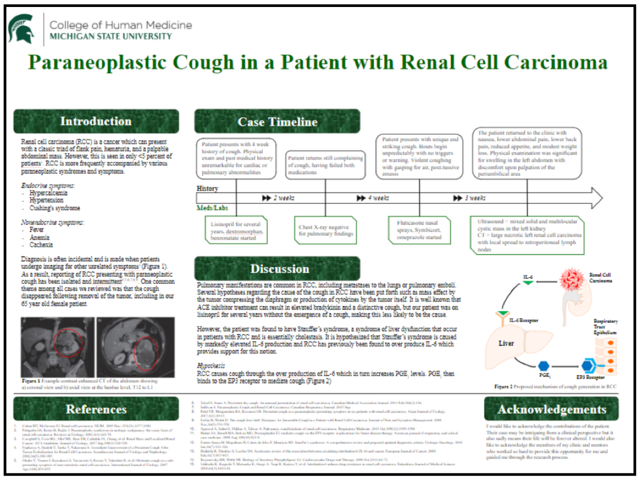

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Paraneoplastic Cough in a Patient with Renal Cell Carcinoma

Introduction

Renal cell carcinoma (RCC) is a cancer which can present with a classic triad of flank pain, hematuria, and a palpable abdominal mass. However, this is seen in only <5 percent of patients[1]. RCC is more frequently accompanied by various paraneoplastic syndromes and symptoms.

Endocrine symptoms:
- Hypercalcemia
- Hypertension
- Cushing's syndrome

Nonendocrine symptoms:
- Fever
- Anemia
- Cachexia

Diagnosis is often incidental and is made when patients undergo imaging for other unrelated symptoms (Figure 1). As a result, reporting of RCC presenting with paraneoplastic cough has been isolated and intermittent[4,5,6,7,8,9]. One common theme among all cases we reviewed was that the cough disappeared following removal of the tumor, including in our 65 year old female patient.

Figure 1 Example contrast enhanced CT of the abdomen showing a) coronal view and b) axial view at the lumbar level, T12 to L1

Case Timeline

History

Patient presents with 4 week history of cough. Physical exam and past medical history unremarkable for cardiac or pulmonary abnormalities

Patient returns still complaining of cough, having failed both medications

Patient presents with unique and striking cough. Bouts begin unpredictably with no triggers or warning. Violent coughing with gasping for air, post-tussive emesis

The patient returned to the clinic with nausea, lower abdominal pain, lower back pain, reduced appetite, and modest weight loss. Physical examination was significant for swelling in the left abdomen with discomfort upon palpation of the periumbilical area

▶▶ *2 weeks* ▶▶ *4 weeks* ▶▶ *3 weeks*

Meds/Labs

Lisinopril for several years, dextromorphan, benzonatate started

Chest X-ray negative for pulmonary findings

Fluticasone nasal sprays, Symbicort, omeprazole started

Ultrasound = mixed solid and multilocular cystic mass in the left kidney
CT = large necrotic left renal cell carcinoma with local spread to retroperitoneal lymph nodes

Discussion

Pulmonary manifestations are common in RCC, including metastases to the lungs or pulmonary emboli. Several hypotheses regarding the cause of the cough in RCC have been put forth such as mass effect by the tumor compressing the diaphragm or production of cytokines by the tumor itself. It is well known that ACE inhibitor treatment can result in elevated bradykinin and a distinctive cough, but our patient was on lisinopril for several years without the emergence of a cough, making this less likely to be the cause.

However, the patient was found to have Stauffer's syndrome, a syndrome of liver dysfunction that occur in patients with RCC and is essentially cholestasis. It is hypothesized that Stauffer's syndrome is caused by markedly elevated IL-6 production and RCC has previously been found to over produce IL-6 which provides support for this notion.

Hypothesis
RCC causes cough through the over production of IL-6 which in turn increases PGE_1 levels. PGE_1 then binds to the EP3 receptor to mediate cough (Figure 2)

Figure 2 Proposed mechanism of cough generation in RCC

References

Acknowledgements

Discussion

- Feasibility and applications at other institutions?

Questions?

Thank you!