

New rapid diagnostic criteria of Acute Sinusitis based on patterns of headache and facial pain in Sinusitis: A study of 117 patients suffering from sinusitis

Nowe i szybkie kryteria diagnostyczne ostrego zapalenia zatok przynosowych oparte na wzorach bólów głowy i bólu twarzy w zapaleniu zatok. Badanie 117 pacjentów cierpiących na zapalenie zatok

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ABSTRACT:

Introduction. There is need for any healthcare setup to rapidly identify Sinus headache patients from other cases of Neurological and Primary headaches like Migraine and Chronic Tension type headache.

Materials and Methods. 117 cases of confirmed sinusitis were evaluated and analysed for common traits which could help in rapid diagnosis of Sinusitis.

Results. Unilateral, dull aching headache and facial pain, of changing intensity, lasting all day on an average of 4 to 6 hours with a previous short history of common cold in acute sinusitis is the most common pattern observed in this study.

Discussion. Unilateral, dull aching headache and facial pain, of variable intensity, lasting all day on an average of 4 to 6 hours along with is highly sensitive criterion (91%) for diagnosis of acute sinusitis. This, along with a history of previous Upper Respiratory tract infection, is useful to rapidly screen patients for acute sinusitis (95% sensitive). Though a subset of other headache cases will also be included by the criteria, imaging or Endoscopy must be done in these positive cases to increase the specificity of the diagnostic criteria.

KEYWORDS:

rhinology, Sinus, headache, chronic sinusitis, acute sinusitis, Diagnostic criteria

STRESZCZENIE:

Wprowadzenie. Istnieje potrzeba, aby dowolna konfiguracja opieki zdrowotnej była w stanie dokonać szybkiej identyfikacji pacjentów z zatokowym bólem głowy w innych przypadkach bólów głowy (neurologicznych i pierwotnych), takich jak migreny i przewlekły ból głowy.

Materiały i metody. Dokonano oceny 117 przypadków potwierdzonych przypadków zapalenia zatok przynosowych, które wykazały cechy wspólne, mogące pomóc w przyspieszeniu diagnozy zapalenia zatok.

Wyniki. Najczęstszym wzorem obserwowanym w badaniu jest jednostronny, głuchy ból głowy i ból twarzy, zmiana intensywności, trwająca codziennie przez średnio 4-6 godzin, z krótką historią przeziębienia w ostrym zapaleniu zatok.

Dyskusja. Jednostronne, głuche bóle głowy i bóle twarzy, o zmiennej intensywności, trwające codziennie przez średnio 4-6 godzin, wraz z wysoce wrażliwym kryterium (91%) w diagnostyce ostrego zapalenia zatok. Wspomniane in-

formację, wraz z historią poprzedniego zakażenia górnych dróg oddechowych są użyteczne dla szybkiej diagnozy pacjentów z ostrym zapaleniem zatok (wrażliwość 95%). Jednakże, w przypadkach tych dochodzi do występowania podzbioru innych przykładów bólu głowy, dlatego też we wspomnianych pozytywnych przypadkach należy przeprowadzić badanie obrazowe lub endoskopię w celu zwiększenia specyficzności kryteriów diagnostycznych.

SŁOWA KLUCZOWE: rynologia, zatoki, bóle głowy, przewlekłe zapalenie zatok, ostre zapalenie zatok, kryteria diagnostyczne

INTRODUCTION

Annually half of the general population (50%) suffers from a headache and 9 out of 10 people from the general public give a history of at least one episode of headache in their whole life [7]. A vast number of patients who present to general clinic for recurrent headache do not suffer from Sinusitis [9]. Sinus headache is marked in its alerting intensity and periodicity and acute sinusitis rapidly responds to antibiotic therapy [10]. The treatment of Sinus headache and other primary headache is very different [6]. Acute sinusitis is untreated can lead to a variety of Complications and needs a longer course of Antibiotics for resolution [10]. Stratification and separation of Sinus headache cases from other Neurological and primary headaches is imperative for any healthcare service. The following study aims to elucidate a diagnostic criterion for rapid diagnosis of acute sinusitis patients from a cohort of patients' in a general medical practitioners clinic or a medical clinic.

MATERIALS AND METHODS

From the cohort of patients who present in our Rhinology clinic, 112 patients were selected who were suffering from Acute or Chronic sinusitis. Symptoms lasting more than 12 weeks were classified under Chronic Rhinosinusitis (CRS), whereas those with shorter duration of illness were put under Acute Rhinosinusitis (ARS) [1]. Few cases, which were, Symptom-free intermittently (complete resolution) but lasting more than 12 weeks in total, were classified as Recurrent Acute Rhinosinusitis (RARS) [1]. The Initial History included the following:

This was followed by a regular E.N.T Clinical evaluation for Rhinosinusitis, on the guidelines established by the European Position Paper on Rhinosinusitis and Nasal Polyps 2012 criteria [1]. This is defined as Nasal blockage or Congestion or Nasal discharge at least one of the two, Facial pain/pressure and Reduced or absence of the sense of smell (Hyposmia /Anosmia). A history of a recent upper respiratory tract infection, fever, halitosis was enquired [7]. Further Anterior Rhinoscopy was done for Nasal discharge or Congestion or oedema of turbinates. This was confirmed by a Diagnostic nasal endos-

Ta. I. General History of Headache [3, 4, 5]

HEADACHE TIME OF ONSET
<ul style="list-style-type: none"> ◆ Onset of headache seconds, minutes, hours, days ◆ Any precipitating Factors ◆ Weight lifting, sex, exercise, cold drinks, food consumption, lack of sleep, fever, exposure to flashes of light, psychological stress
Location of pain in the Cranium and face
<ul style="list-style-type: none"> ◆ Unilateral or bilateral or alternating or no specific pattern
Duration of pain:
<ul style="list-style-type: none"> ◆ migraine 4 or more hours, cluster headache<3 hours
Frequency and timing of attacks
<ul style="list-style-type: none"> ◆ Cluster headache—multiple attacks per day, Frontal sinus headache/ Union headache
Pain severity
Quality of pain
<ul style="list-style-type: none"> ◆ Throbbing, stabbing, burning, Any paraesthesia of face or scalp ◆ Use of any medications for 3or more months (Medication Overuse headache) ◆ Variation in the intensity of pain (Variability) [9]

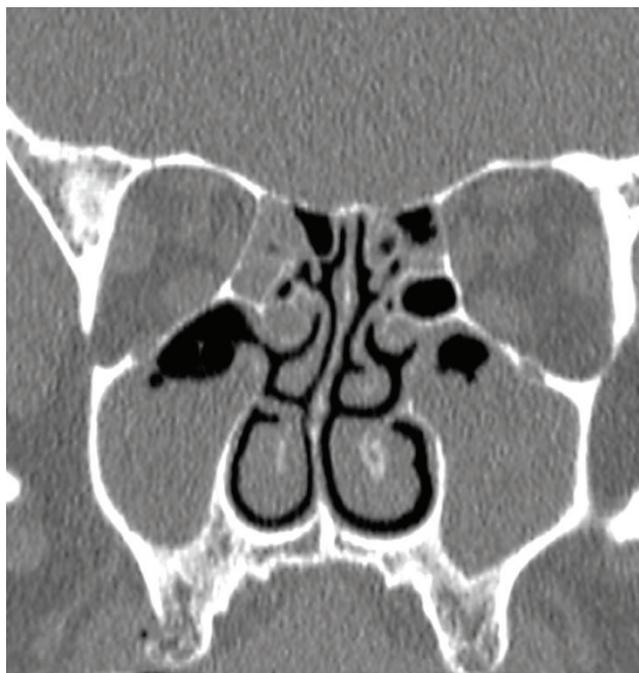


Fig. 1. Lund-McKay Grade 2 (Both Maxillary sinus) with Grade 1 (Both side ethmoidal) Sinusitis. This case had a total score of 9 and 11[2]. A total of 63 cases underwent Computed tomography scan of Para-nasal Sinuses for confirmation of Sinusitis or due to ambiguity of diagnosis.

Tab. II. Red Flags in Headache (“SNOOP”) Criteria for exclusion [3, 4]

- ◆ Systemic symptoms (fever, weight loss) or Secondary risk factors (HIV, systemic cancer)
- ◆ Neurologic symptoms or abnormal signs (impaired alertness or consciousness, confusion)
- ◆ Onset: sudden, abrupt, or split-second
- ◆ Older: new-onset and progressive headache, especially in middle age (male, age greater than 50 years, higher risk for giant cell arteritis)
- ◆ Previous headache history: different headache (marked change in attack frequency, severity, or clinical features)

Tab. III. Character of Headache and Facial pain in Sinusitis

NR	SYMPTOMS	PERCENTAGE OF CASES
1. Acute Sinusitis N=63 cases	Unilateral Pain or Paraesthesia of the cheek	86% (54)
	Unilateral Frontal headache	81% (51)
	Throat pain	68% (43)
	Pain between the eyes	30% (19)
	Vertex headache	13% (8)
	Unilateral Temporal headache	11% (7)
	Unilateral Ear pain	8% (5)
2. Chronic Rhinosinusitis (CRS) 43 cases	Unilateral dull aching headache and facial pain (Any pain), Frontal, Temporal Maxillary or between the eyes, Bilateral pain was excluded, see discussion section	44% (19)
	Throat pain	37% (16)
3. Recurrent Acute Rhinosinusitis (RARS) Confirmed 11 cases	Unilateral dull aching headache and facial pain (Any pain), Episodic pain only Continuous Bilateral pain was excluded, see discussion section	100%

copy under local anaesthesia, which demonstrated purulent discharge from the Middle meatus or other sinus ostia [3]. The time duration of Symptoms of Acute post-viral rhinosinusitis is defined as an increase of symptoms after 5 days or persistent symptoms after 10 days with less than 12 weeks of duration following as per E.P.O.S 2012. Acute bacterial rhinosinusitis (ABRS) is defined as ‘Double sickening’ (Second syndrome) plus Systemic signs and purulent nasal discharge. E.P.O.S 2012 criteria of time duration of symptoms were thus checked for inclusion of cases.

Computed Tomography (CT Scan) of the Paranasal sinuses which is very useful in unambiguous confirmation of diseases was done when Acute bacterial rhinosinusitis (ABRS) was suspected or in cases where diagnosis was not obvious. Diagnostic criteria included the presence of more than 4-millimetre mucosal thickening in Paranasal sinuses. Lund-McKay Radiologic Sinusitis Grading system [2] was used to grade the extent of Sinusitis.

Tab. IV. Quality of Headache and Facial pain in Sinusitis

S. NR	SYMPTOMS [9]	PERCENTAGE OF CASES
1. Acute Rhinosinusitis N=63 cases	Unilateral Dull aching, variable intensity, continuous for few hours usually 4 to 6	95% (60)
	Unilateral Pain crescendo (Increasing) intensity from morning till afternoon	49% (31)
	Unilateral Pain increased when bending forward	34% (22)
	Unilateral Stabbing type of sharp pain	30% (19)
	Unilateral Feeling of heaviness of face	71% (45)
	Unilateral Paraesthesia or altered sensation of face	8% (5)
2. Chronic Rhinosinusitis (CRS) 43 cases	Nonspecific pain	3% (2)
	Unilateral Dull aching, episodic on and off	95,3% (41)
	Unilateral Paraesthesia or altered sensation of face	55,8% (24)
3. Recurrent Acute Rhinosinusitis (RARS) Confirmed 11 cases	Unilateral Dull aching, Continuous pain	13,9% (6)
	Unilateral dull aching headache and facial pain (Any pain), Episodic pain only Continuous Bilateral pain was excluded, see discussion section	100% (11)

According to the available evidence in literature, currently Standard X-ray of Paranasal sinuses are inadequate to diagnose Rhinosinusitis, hence this was not done.

INCLUSION CRITERIA

Patient diagnosis was confirmed and classified into 3 types of Rhinosinusitis:

1. Acute Rhinosinusitis (ARS) Confirmed 63 cases included in this study
 - ◆ 10 patients fulfilling EPOS 2012 criteria for Acute Post-Viral Rhinosinusitis (APVRS) [1]
 - ◆ 53 patients fulfilling EPOS 2012 criteria for Acute Bacterial Rhinosinusitis (ABRS) – C.T scan imaging confirmation done in 21 cases [1]
2. Chronic Rhinosinusitis (CRS) Confirmed 43 cases included in this study C.T scan imaging confirmation done in 37 cases.

Tab. V. Diagnostic criteria for Sinus headache proposed with relevant Bio-statistical data

ACUTE RHINOSINUSITIS (ARS)	DIAGNOSTIC POINT OR TRAIT	SENSITIVITY OF CRITERION WITH P VALUE	SPECIFICITY OF CRITERION WITH P VALUE
Ostre zapalenie nosa i zatok przynosowych (ARS)	Dull aching pain of varying intensity, lasting on an average 4 to 6 hours	90.90% (Meaning, most Acute sinusitis cases can be diagnosed rapidly by this test) p=0.0034 at a 95% confidence interval (Alpha is 0.05)	21% (Meaning, many non-sinusitis patients will get diagnosed wrongly) p=0.018 at a 95% confidence interval
	Dull aching pain lasting on an average 4 to 6 hours and Previous history of a Common Cold within previous 2 weeks	95% (same) p=0.00992 at a 95% confidence interval	55% (same) p=0.0356 at a 95% confidence interval
	Unilateral character of Headache and facial pain	76% (same) p=0.042 at a 95% confidence interval	15% (same) p=0.0232 at a 95% confidence interval
Chronic Rhinosinusitis (CRS)	Unilateral dull aching headache and facial pain Episodic	16% p = 0,0092 przy 95% przedziale ufności	9% p=0.032 at a 95% confidence interval
Recurrent Acute Rhinosinusitis (RARS)	Too small sample size to be of any statistical significant result	p=5.98 at a 95% confidence interval not significant	

3. Recurrent Acute Rhinosinusitis (RARS) Confirmed 11 cases included in this study

C.T Scan confirmation was done in 5 cases.

This was the inclusion criteria of cases for this research.

EXCLUSION CRITERIA

The American Headache Society's SNOOP Criteria [3 and 4] was used in Screening of cases by our residents. Presence of any of the following signs or symptoms is a red flag and indicates the need to perform a more extensive evaluation.

RESULTS

The observations are described in the following sections:

Character of Headache and Facial pain

The most common type of pain was unilateral in most of the patients [7] which is strongly suggestive of Acute Sinusitis. The pain was most often localized to Frontal region or Cheeks or teeth.

Quality of pain in Sinus diseases

The following observations were made on patients regarding the quality of pain and headache.

DISCUSSION

The term "Sinus headache" is a dubious one, as the sinuses themselves are relatively insensitive to pain [7]. The most common types of headache and facial pain in clinics present in frontal, ocular, temporal or vertex region are easy to be erroneously concluded as caused by sinus pathology [11]. The International Classification of Headache Disorders, second edition

(ICHD-II) does not even attribute causation of headache to chronic sinusitis; chronic sinusitis is not a diagnosis to be made in any patient with pain. Orbital or retro-orbital pain, eye redness, rhinorrhea, nasal congestion, eyelid oedema, miosis, lacrimation, and facial congestion are seen in Cluster headache which can be easily misdiagnosed as Sinus pathology. These autonomic features are usually noted immediately after getting up from sleep, which is a diagnostic clue. Attacks happen in clusters, episodic pain attacks of 1 to 8 times per day followed by periods of remission, lasting months and even years, hence the name "Cluster" headache. These features are important diagnostic points.

Comprehensive bio-statistical evaluations were done using the PAST Statistical software package. A Confidence interval of 95% (p=0.05) was setup for the entire Hypothesis tested in this study. Analysis of variance test (ANOVA), Pearson's Chi-square test and linear regression modeling were employed in order to compare the observed traits according to demographic and clinical characteristics. When condition of normality of data was doubtful, we used a nonparametric test to compare two samples such as the Mann-Whitney. Members of the co-

hort were normal patients who were tested and found free of this disease. Student's t test using separate variance for two independent population means was used at a 95% confidence interval to conclude a statistical difference.

The most common cause of headache in clinical practice is Chronic Tension Type headache and Migraine. According to some study, 4 to 5% of general population suffers from Chronic Tension Type headache. The main diagnostic point of Chronic Tension Type headache is that the headache is Bilateral while Sinus headache in most cases is Unilateral or one-sided. However, the pain which is dull aching and continuous, accompanied by a feeling of heaviness, is exactly similar to Sinus headache.

An estimated 12% of the North American population suffers from some form of migraine [6], migraine headache is unilateral and accompanied by an Aura (Classic migraine) and most patients have a tumultuous attack of migraine which is in stark contest to insidious sinus headache. When Aura is absent (Common migraine), the pain of migraine is described as throbbing, with severe intensity, accompanied by photophobia. This picture is again much different from the Sinus headache. Pooling of data from other causes of headaches in clinics, in addition hospital data was used in the derivation of a diagnostic criteria. Sensitivity is defined as the ability of a test or cri-

terion to correctly identify those who actually have a disease, while specificity is defined as the ability of a test to identify those persons who do not suffer from a disease or trait, but pass the test or criteria.

Keeping in view the broad contrast of symptoms, we would like to propose the following simple system diagnosis of Sinusitis.

CONCLUSION

- ♦ Unilateral, dull aching headache and facial pain of variable nature, persisting every day on an average of 4 to 6 hours, is a highly sensitive rapid superset criteria for the diagnosis of Acute sinusitis.
- ♦ This criteria if applied will also include many patients suffering from Acute Rhinosinusitis as defined by the E.P.O.S 2012 criteria.
- ♦ This, along with a history of previous Upper Respiratory tract infection, is useful to rapidly screen patients for Acute sinusitis.
- ♦ Though a subset of other headache cases will also get included by the criteria, hence imaging or Endoscopy must be done in these cases to increase the specificity of the criteria.

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