# Management Strategies of Acute Bacterial RhinoSinusitis


## ABSTRACT

**Aims：** The aim of the work is to compare 3 different Guidelines for Management of ABRS and determine the most appropriate Guideline to be adopted by the Egyptian patients.

**Methodology**：This was a prospective study conducted on 90 consecutive patients selected from the outpatient clinic of Otorhinolaryngology department at Tanta university hospital within the period from December 2019 to December 2020.

**Results：** the Arabic version of nose scale distribution among studied groups before and after intervention. Before intervention, there were no statistically significant differences among the three studied groups and among each other's ($P>0.05$). After intervention, there were highly statistically significant differences among the three studied groups and each other's ($P<0.001$) being highly decreased in group 2 followed by group A and lastly group C. Paired t test demonstrated highly statistically significant difference before and after intervention in the three studied groups ($P<0.001$).

**Conclusion :** In conclusion, the current study reported that, the three approaches demonstrated promising outcomes for management of ABRS in terms of SNOT as well as Arabic version of nose scale. However, Epos 2020 Guidelines of ARS were demonstrated to be associated with the most promising ones.


### ABBREVIATIONS

ABRS : Acute bacterial rhinosinusitis
A-NOSE : Arabic version of nose scale
ARS : Acute rhinosinusitis
AVRS : Acute viral rhinosinusitis
SNOT-22 : Sino-Nasal Outcome Test 22
NSAIDS : Nonsteroidal anti-inflammatory drugs
INCS : Intranasal corticosteroids

## 1. Introduction

Rhinosinusitis is defined as symptomatic inflammation of the paranasal sinuses and nasal cavity. The term rhinosinusitis is preferred because sinusitis is almost always accompanied by inflammation of the contiguous nasal mucosa [1, 2].

Acute bacterial rhinosinusitis (ABRS) is suggested by the presence of at least 3 symptoms/signs of [3]:

- Discolored discharge (with unilateral predominance) and purulent secretion in cavum nasi .
- Severe local pain (with unilateral predominance)
- Fever (>38ºC)
- Elevated ESR/CRP
- 'Double sickening' (i.e. a deterioration after an initial milder phase of illness) . (3,4)

This guideline addresses varied troubles withinside the management of acute being rhinosinusitis (ABRS), in conjunction with (I) incapability of current medical standards to fitly differentiate being from infectious agent acute rhinosinusitis, main to all-fired and beside the aim antimicrobial remedy; (II) gaps in data and best proof relating to empiric antimicrobial remedy for ABRS due to obscure affected person various standards; (III) dynamic incidence and antimicrobial standing profiles of being isolates related to ABRS; and (IV) impact of exploitation conjugated vaccines for strep pneumoniae at the emergence of non vaccine serotypes related to ABRS [5].

## 2. MATERIALS AND METHODS

This was a prospective study conducted on 90 consecutive patients selected from the outpatient clinic of Otorhinolaryngology department at Tanta university hospital within the period from December 2019 to December 2020.

### 2.1 The Inclusion Criteria

- Age (16-50) years.
- Presence of at least 3 symptoms/signs of discolored discharge (with unilateral predominance), purulent secretion in cavum nasi.
- Severe local pain (with unilateral predominance).
- Fever (>38ºC).
- Elevated ESR/CRP.
- Double sickening ( deterioration after an initial milder phase of illness).

### 2.2 Exclusion Criteria

- Any Systemic Disease (DM, HTN, Renal disease).
- Chronic rhinosinusitis with or without nasal polyposis.
- History of Chronic Nasal disease.
- Previously nasal surgery.
- Smokers.

### 2.3 Methods

1. Complete history taking.
2. Questionnaire to evaluate nasal obstruction symptoms done by Arabic version of nose scale (A-NOSE) .

3. Questionnaire to evaluate Nasal obstruction symptoms done by Arabic version of Sino-Nasal Outcome Test 22 (SNOT-22) Scale.
4. General examination.
5. Otorhinolaryngological clinical examination.
6. Laboratory investigation (CRP, ESR).
7. Patients were randomly included into 3 groups (n=30):

- **Group 1 (n=30):** Patients with ABRS were treated according To American Guidelines of ARS (6).

    a) Nasal Saline Irrigation.
    b) Analgesics: NSAIDS or Acetaminophen.
    c) Local and systemic Nasal Decongestant.
    d) Intra-Nasal Corticosteroids: mometasone (2 buffs Daily).
    e) Antibiotic Course: Amoxicillin-Clavulonic Acid (2 gm orally 2/d or 90 mg/kg/d twice/day) for 7-10 days.

- **Group 2** (**n=30):** Patients with ABRS were treated according To Epos 2020 Guidelines of ARS (7)

    a) Analgesics: NSAIDS or Acetaminophen.
    b) Intra-Nasal Corticosteroids: mometasone (2 buffs daily) in mild to moderate cases.
    c) Systemic Corticosteroids.
    d) Mucolytic.
    e) Antibiotic Course: Moxifloxacin (400mg once/day) for 5 days.

- **Group 3 (n=30):** Patients with ABRS were treated according To Canadian Guidelines of ARS (8,9)

    a) Analgesics: NSAIDS or Acetaminophen.
    b) Local and systemic Nasal Decongestant.
    c) Intra-Nasal Corticosteroids: Mild to Moderate cases.
    d) Antibiotic Course: Amoxicillin (500 mg 3 times/daily) for 7-10 days..

## 2.4 Statistical analysis

Data were fed to the computer and analyzed using IBM SPSS Corp. Released 2013. IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp. Qualitative data were described using number and percent. Quantitative data were described using mean, standard deviation for parametric data after testing normality using Kolmogrov-Smirnov test. Significance of the obtained results was judged at the (0.05) level.

## 3. Results

**Table (1)** : illustrate the Arabic version of nose scale distribution among studied groups before and after intervention. Before intervention, there were no statistically significant differences among the three studied groups and among each other's **(P>0.05).** After intervention, there were highly statistically significant differences among the three studied groups and each other's **(P<0.001)** being highly decreased in group 2 followed by group A and lastly group C. Paired t test demonstrated highly statistically significant difference before and after intervention in the three studied groups **(P<0.001).** However, the percentage of changes were demonstrated to be insignificant among the three studied groups each other's **(P>0.05).**

## Table (1): Arabic version of nose scale distribution among studied groups before and

**after intervention:**

| | Group 1 N=30 | Group 2 N=30 | Group 3 N=30 | test of significance | within group significance |
|---|---|---|---|---|---|
| **A.nose before mean±SD** | 18.73±1.26 | 18.67±1.09 | 19.0±0.91 | F=0.777<br>P=0.463 | P1=0.814<br>P2=0.349<br>P3=0.242 |
| **A.nose after mean±SD** | 3.86±0.63 | 2.93±0.78 | 5.87±0.89 | F=111.02<br>P<0.001* | P1<0.001*<br>P2<0.001*<br>P3<0.001* |
| **Paired t test** | t=73.63<br>p<0.001* | t=59<br>p<0.001* | t=114.39<br>p<0.001* | | |
| **% of change** | 79.4% | 84.3% | 69.1% | | p1=0.624<br>p2=0.363<br>p3=0.165 |

**Table (2)** : display the Arabic version of Sino-Nasal Outcome Test among studied groups before and after intervention. Before intervention, there were statistically significant differences among the three studied groups and also between group 2&3 **(P>0.05).** After intervention, there were highly statistically significant differences among the three studied groups and also among each other's **(P<0.001)** being highly decreased in group 2 followed by group A and lastly group C. Paired t test demonstrated highly statistically significant difference before and after intervention in the three studied groups **(P<0.001).** However, the percentage of changes were demonstrated to be insignificant among the three studied groups each other's **(P>0.05).**

**Table (2): Arabic version of Sino-Nasal Outcome Test among studied groups before and after intervention:**

| | Group 1 N=30 | Group 2 N=30 | Group 3 N=30 | test of significance | within group significance |
|---|---|---|---|---|---|
| **S.nose before mean±SD** | 84.67±2.82 | 82.80±4.98 | 85.07±2.64 | F=3.31<br>P=0.04* | P1=0.051<br>P2=0.672<br>P3=0.018* |
| **S.nose after mean±SD** | 15.13±1.69 | 12.60±1.38 | 17.60±1.43 | F=82.45<br>P=0.001* | P1<0.001*<br>P2<0.001*<br>P3<0.001* |
| **Paired t test** | t=114.75<br>p<0.001* | t=72.99<br>p<0.001* | t=195.64<br>p<0.001* | | |
| **% of change** | 82.1% | 84.8% | 79.3% | | p1=0.779<br>p2=0.787<br>p3=0.575 |

## 4. DISCUSSION

Acute bacterial rhinosinusitis (ABRS) may be a comparatively usual illness associated with large direct and oblique fees. it's overriding that a practician will distinguish among acute microorganism rhinosinusitis and ABRS to stay aloof from useless

antibiotic usage. it's likewise important to acknowledge that organising a analysis of ABRS will currently now not necessitate the prescribing of antibiotics, except the ABRS affected person provides with excessive or worsening signs Associate in Nursingd symptoms or an ABRS complication. Complications contains extension of contamination to the orbit and first disquieted system. imprudent use of antibiotics imparts social group fees in phrases of economic value additionally to tributary to raised degrees of microorganism resistance [10].

The aim of the current study was to compare the different Guidelines for management of ABRS and determine the most appropriate Guideline to be adopted by the Egyptian patients.

This was a prospective study conducted on 90 consecutive patients selected from the outpatient clinic of Otorhinolaryngology department at Tanta university hospital

In terms of Epos guidelines, **Hadley et al. (2010)** conducted their study on a total of 118 cases (400 mg of oral moxifloxacin, n = 73; placebo, n = 45 for 5 days). Clinical success rates were numerically higher for moxifloxacin (78.1%, 57/73) versus placebo (66.7%, 30/45); (P = .189). Significantly greater mean reductions in SNOT-16 scores occurred in moxifloxacin- versus placebo-treated patients (-17.54 vs. -12.83; P = .032). Overall concomitant medication use was lower in moxifloxacin versus placebo patients (38.4%, 28/73 vs. 55.6%, 25/45 respectively). Premature discontinuation due to insufficient therapeutic effect was significantly lower in moxifloxacin- versus placebo-treated patients (8.2%, 6/73 vs. 22.2%, 10/45; P = .031). The rate of treatment-emergent adverse events in the ITT population was similar between arms (moxifloxacin 38.2%, 96/251; placebo 40.7%, 50/123) [11]

Concerning American guidelines, the next medical displays (any of three) ar inspired for working out sufferers with acute microorganism vs microorganism rhinosinusitis: i. Onset with chronic signs and symptoms or symptoms and symptoms well suited with acute rhinosinusitis, lasting for ≥10 days with none proof of medical development (strong, low-mild); ii. Onset with excessive signs and symptoms or symptoms and symptoms of excessive fever (≥39°C [102°F]) and septic nasal discharge or facial ache lasting for as a minimum three–four consecutive days at the beginning of malady (strong, low-mild); or iii. Onset with worsening signs and symptoms or symptoms and symptoms characterized through the novel onset of fever, headache, or growth in nasal discharge following a traditional microorganism higher respiration contamination (URI) that lasted five–6 days and had been to start with up ("double-sickening") (strong, low-mild) [5].

High-Dose Amoxicillin-Clavulanate recommended during Initial Empiric Antimicrobial Therapy for ABRS. "High-dose" (2 g orally twice daily or 90 mg/kg/day orally twice daily) amoxicillin-clavulanate is recommended for children and adults with ABRS from geographic regions with high endemic rates (≥10%) of invasive penicillin- non susceptible (PNS) *S. pneumoniae*, those with severe infection ( evidence of systemic toxicity with fever of 39°C [102°F] or higher, and threat of suppurative complications), attendance at daycare, age <2 or >65 years, recent hospitalization, antibiotic use within the past month, or who are immunocompromised (weak, moderate) [5]

The justification for amoxicillin as first-line remedy for max sufferers with ABRS pertains to its safety, efficacy, low cost, and slender microbiologic spectrum [1,12, 7]

The Canadian suggestions base severity through the credential to that signs and symptoms impair the affected person. Thus, low severity is delineated as delicately tolerated signs and symptoms, gentle severity displays regular signs and symptoms which might be tolerable, and excessive severity suggests that signs and symptoms ar laborious to tolerate or intrude with sleep or daily activities. This technique will currently now not rely on the presence of fever , that is not lined as a primary symptom of ABRS. Symptom severity is then accustomed decide healing intervention.

According to the general guidelines, amoxicillin stays the primary-line want for ABRS, with trimethoprim/sulfamethoxazole (TMP/SMX) or macrolides inspired for folks with b-lactam hypersensitivity reaction. However, antibiotic want depends upon totally different problems furthermore, consisting of close antimicrobial resistance patterns, affected person threat of resistance, and threat of headaches of failure owing to underlying illness. For sufferers with threat of resistance or headaches of first-line failure, a second-line agent (amoxicillin/clavulanic acid combos, fluoroquinolones) is sometimes counseled [13]

With regard to Arabic version of nose scale distribution among studied groups, before intervention, there were no statistically significant differences among the three studied groups and among each other's (P>0.05). After intervention, there were highly statistically significant differences among the three studied groups and each other's (P<0.001) being highly decreased in group 2 followed by group 1 and lastly group 3. Paired t test demonstrated highly statistically significant difference before and after intervention in the three studied groups (P<0.001). However, the percentage of changes were demonstrated to be insignificant among the three studied groups each other's (P>0.05).

Regarding Arabic version of Sino-Nasal Outcome Test (SNOT) distribution among studied groups, before intervention, there were no statistically significant differences among the three studied groups and among each other's. After intervention, there were highly statistically significant differences among the three studied groups and each other's (P<0.001) being

highly decreased in group 2 followed by group 1 and lastly group 3. Paired t test demonstrated highly statistically significant difference before and after intervention in the three studied groups ($P<0.001$). However, the percentage of changes were demonstrated to be insignificant among the three studied groups each other's ($P>0.05$).

It was demonstrate that, SNOT could be used as a helpful tool for quantifying changes in symptoms and, can be used to predict extent of the degree of improvement either following surgical or medical recommended [(14)].

## 5. CONCLUSION

In conclusion, the current study reported that, the three approaches demonstrated promising outcomes for management of ABRS in terms of SNOT as well as Arabic version of nose scale. However, Epos 2020 Guidelines of ARS were demonstrated to be associated with the most promising ones.

## CONSENT AND ETHICAL APPROVAL

The current work protocol was permitted Tanta Medical research ethics committee, agreement of the directors of the hospitals in which the work was performed, all participants give an agreement to be involved in this work, personal privacy was appreciated in all stages of this work and recorded data will not be employed for any other aim.

## COMPETING INTERESTS

Authors have declared that no competing interests exist

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