Development of pneumatoceles after viral infection

Mustafa K. Celen, MD, Celal Ayaz, MD, Esen Ozmen, MD, Salih Hosoglu, MD, Mehmet F. Geyik, MD.

Staphylococcal pneumonia is most commonly seen after viral lower respiratory infections. It is one of the major factors affecting elderly individuals with bronchiectasis and nosocomial pneumonia. It progresses fast, and occurs with multilobular involvement, cavitation, and empyema (10%). Staphylococcal pneumonia represents 1% of all pneumonia in children. Studies have shown a mortality rate of 7% in staphylococcal pneumonia. Typical symptoms includes fever, lethargy, tachypnea, and cyanosis, as well as lack of appetite, nausea, and abdominal distension. Frequent empyema and pneumothorax can also be observed. In lung x-ray, diffuse infiltration or typical findings (pleural effusion, pneumothorax, and pneumatoceles) may be present. Management of staphylococcal pneumonia in the 1960's includes a combination of antibiotic therapy and surgical drainage. Recently, the incidence of staphylococcal pneumonia in children has decreased. Although etiology of the decrease in incidence is not clearly known, its prevalence is still higher in developing countries.

The objective of this study was to investigate the pneumatoceles, a rare complication of staphylococcal pneumonia, spontaneously resorbed from proper antibiotherapy without any need for surgical intervention. Pneumatoceles are air-comprising spaces having a radiolucent appearance on the lung. [1]

An 18-year-old male patient with a pre-diagnosis of lung infection was admitted to the Department of Clinical Microbiology and Infectious Diseases upon complaints of shortness of breath, cough, and fever. He complained of pain in the epigastrium, and chest pain during breathing for 15 days after upper respiratory infection. He received cefazolin 2 gr/day and clarithromycin 1 gr/day with complaints of side pain and sweating within the last 5 days. Physical examination findings were as follows: fever 38.5^{o}C, blood pressure 100/60 mm Hg, pulse 100/min, inspiration 48/min, Icteric sclerae, conjunctival pale, and crepitant rales on both lower lung zones during auscultation. He had intercostal retractions. The laboratory values were found as follows: white blood cells were 14.400/mm^3 (76% polymorphonuclear cells), erythrocyte sedimentation rate was 30 mm/h, hemoglobin 12.6 g/dl, platelets 79.000/mm^3, urea: 131 mg/dl (normal range 12-45 mg/dl), aspartate transaminase (AST): 222 U/L (normal range 9-32 U/L), alanine aminotransferase (ALT): 151 U/L (normal range 12-35 U/L), creatinine: 1.7 mg/dl (normal range 0.6-1.1 mg/dl), total bilirubin: 5.1 mg/dl (normal range 0.6-1.1 mg/dl), direct bilirubin: 2.7 mg/dl (normal range 0.3-0.8 mg/dl), Na: 130 mmol/L (normal range 125-139 mmol/L), K: 5.3 mmol/L (normal range 3.5-5.5 mmol/L), albumin: 2.9 g/dl (normal range 2.5-3.5 g/dl, and C-reactive protein: 191 mg/L (normal range 0-8 mg/L). In lung x-ray, non-homogenous parenchymal opacities and bronchopneumonic consolidation areas were observed. Samples for blood, sputum, stool, throat, and urine were taken. Treatments of cefotaxime 3 gr/day, and clarithromycin 1 gr/day were practically initiated. Increase in ventilation difficulty and crepitant rales continued during 4 days after hospitalization. When fever started, which was sub-febrile, blood sample was collected and test was repeated. The test revealed an increase of Methicillin-sensitive *Staphylococcus aureus* (*S. aureus*). Repeated lung x-ray demonstrated an appearance conforming to plenty of pneumatoceles on the middle and lower zones of the left lung. As a result of thoracic ultrasonography and thoracic CT, performed due to marked lack of ventilation on the left side, many pneumatoceles (largest being 42 x 24 mm) and pleural effusion on the left lung were determined. From the pleural liquid aspirate, *S. aureus* grew, which was noted to have the characteristics of exudate. Thoracic ultrasonography, which was repeated 2 days later, demonstrated an enlargement on pneumatoceles. At day 8, the antibiotic regimen was changed due to increase in shortness of breath in the patient, and only cefazolin 3 gr/day was given. Upon consultation with a thoracic surgeon, applying the surgical drainage was planned, but it was agreed to wait due to the occurrenceof hospital infection and an additional cost increases. Blood gas presentation for the patient on oxygen support was determined as pH: 7.31, HCO_3: 18, base deficiency as 4 and oxygen saturation as 92%. The fever was taken under control at day 19, and his overall condition improved. The size of pneumatoceles decreased at day 23 and current antibiotic therapy was discontinued at day 27. Majority of the pneumatoceles were spontaneously resorbed at day 35. At 3 months follow up, no findings or pathological appearance was observed.

In a prospective study, *Staphylococci* were found as pathogen in 4% of the 130 cases with community-acquired pneumonias cases.[1] Typical radiological findings in patients with staphylococcal pneumonia include multilobular consolidation, cavitation,

pneumatocele, and spontaneous pneumothorax. Furthermore, due to worsening of the blood gas parameters, pleural effusion and segmentary collapse may develop. Post-infective pneumatoceles occur concomitantly with bronchopneumonia or loberpneumonia.[2] In our case, radiological pneumatoceles and pneumomediastinum developed as a result of bronchopneumonia and consolidation area. Due to obstruction in the alveolus and bronchioles by intraalveolar exudates accumulation and swelling and impairment on alveolar septa, risk of pneumatocele development increases. Pneumothorax develops following alveolar destruction, lung tissue necrosis and pneumatocele rupture. Prevention of this life-threatening event depends on immediate diagnosis and treatment. Computerized tomography is a major instrument for the diagnosis of pneumatoceles.[3] In our case, CT was beneficial in diagnosing plenty of pneumatoceles. As seen in our case, post-infective pneumatoceles may also appear radiologically in consolidation areas.

Hemorrhagic necrosis and cavitation are characteristics of bronchopneumonias developed by *Staphylococcus*. In most of the cases, pleural surface is covered by thick, fibropurulent exudates. Many abscesses occur including leucocytes, erythrocytes, necrotic residues, and *Staphylococcus*. As a result of small abscesses under pleura, pyopneumothorax, and sometimes bronchopulmonary fistula may develop. Septical thrombosis occur on pulmonary veins in the inflammation area.[4] George et al[5] published, a 1½-year-old child with minor burns (12% total body surface area), who developed a large pneumatoceles and pneumomediastinum following *S. aureus* pneumonia causing severe respiratory distress and needing ventilatory support. Most of the pneumatoceles were spontaneously absorbed over a period of 10 days while surgical interference was being contemplated. A conservative approach to pneumatoceles as in non-burn patients may help prevent unnecessary surgery. Pneumatoceles were resorbed spontaneously in our case. This case has shown that avoiding unnecessary surgical invention is beneficial to controlling of hospital infection. It is an original case from the viewpoint of postponing the surgical intervention, although it is seen frequently. In pneumatoceles cases surgical intervention can be delayed during the time that the oxygen saturation is lower than 85%, patient can tolerate the clinic situation and take the proper anti-biotherapy. Anti-biotherapy has been planned in 3-4 weeks, and finished in the 27 day.

In conclusion, the prevention of unnecessary surgical intervention may decrease hospital infections and the cost of hospital expense.

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From the Department of Infectious Diseases and Clinical Microbiology, University of Dicle Diyarbakir, Turkey. Address correspondence and reprint requests to: Dr. Mustafa K. Celen, Department of Infectious Diseases and Clinical Microbiology, Dicle University, Diyarbakir 21280, Turkey. Tel. +90 (412) 2488006. Fax. +90 (412) 2488440. E-mail: mkcelen@hotmail.com

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Fast tract colonoscopy as a primary investigation in symptomatic patient. *Experience in a small district general hospital*

Nasser M. Amer, *MBBS, FRCS (Ed).*

Large bowel cancer is the second most common cancer in the United Kingdom where 28,000 new cases are diagnosed annually with peak incidence in the 60-80 age groups, and 19,000 deaths every year.[1] We have demonstrated that colonoscopy as the primary investigative procedure in symptomatic patients is feasible, and can be conducted in any small district hospital. One hundred-nineteen symptomatic patients were fast tracked to a small district hospital for colonoscopy, out of which 45 (38%) patients demonstrated some pathology, including cancer in 7 (6%) patients. The consensus is to ask the general practitioners to fast track patients directly for colonoscopy if they fall in any of these criteria: 1. The presence of blood/slime in the motion. 2. Persistent change in bowel habit (If diarrhea-stool culture should be negative). 3. Abnormality on rectal examination/proctoscopy/sigmoidoscopy, and 4. "At risk" patients for bowel neoplasm. Bowel preparation

using Picolax® was arranged by the general practitioners, and colonoscopy was carried out either by the consultant surgeon or the registrar. Biopsies were taken from all suspicious lesions, and benign polyps were snared or fulgurated using hot diathermy after documenting their position. Proctoscopy +/- injection of piles or banding was added if indicated for completion of the examination. The procedure was carried out in 52 (43%) males, and 67 (56%) females with a median age of 62.6 years (30-90). There were no mortalities or major complications. Pathology was found in 45 patients (38%) (**Table 1**) of which 17 patients (14%) had benign polyps, and 7 patients (6%) had cancers. Anatomically, 13 polyps were found in the sigmoid colon, 2 in the transverse colon, and 2 in the ascending colon. Three cancers were found in the sigmoid, one in the rectum, one in the ascending colon, and 2 in the transverse colon. Histology of the malignant lesion showed 4 patients with Duke C staging, and 3 with Duke B. Seven patients (6%) had planned surgery, 70 patients (59%) were followed as outpatients for their symptoms/findings and 42 patients (35%) were discharged.

The most common symptom among our group of patients with positive pathology was change in bowel habits; however, acute diarrhea should not be included as an indication for referral. Lower gastro intestinal bleeding came second, which is defined as bleeding distal to the ligament of Treitz with duration less than 3 days.[2] Despite the popularity of flexible sigmoidoscopy in open access clinics, we would have missed 30% of the lesions if only sigmoidoscopy was adopted. These results were backed up by the results of Gilbert et al[3] where 449 colonoscopies were carried out, and 38% of the lesions were found in the right colon. Swarbrick et al[4] also reported 42% of the colonic cancer and 23% of the polyps were beyond the reach of the flexible sigmoidoscope. Although pain is not an indication of for colonoscopy as stated the American Society of Gastro-Enterology,[5] one of our cancer patients presented mainly with pain. Anemia and occult blood in the stool on the other hand are justifiable indications for colonoscopy, and in our series, 17% of the yield presented with anemia, one of which was cancer.

To conclude, we can say that fast tracking symptomatic patients for colonoscopy was a successful experience, and can be applied to any district general hospital regardless of its size. However, better yield can be achieved by abiding by the guidelines, particularly avoiding referring patients younger than 40 of age.

Table 1 - Demonstrating the different pathologies encountered.

Pathology encountered	N	(%)
Benign polyps	17	(14)
Cancer	7	(6)
Diverticular disease	20	(17)
Crohn's disease	1	(0.8)
Colitis	7	(6)
Normal study	64	(54)

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From the Department of General Surgery, Newham University Hospital, Glen Rd, Plaistow, London. Address correspondence and reprint requests to: Mr. Nasser M. Amer, General Surgery, Newham University Hospital, Glen Rd, Plaistow, London E13 8SL. E-mail: nasser.amer@btinternet.com

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Oxidative stress in patients with pulmonary tuberculosis

***Amir Ghorbanihaghjo**, MSc, PhD,*
***Nadereh Rashtchizadeh,** MSc, PhD,*
***Mohammad Rohbaninoubar,** MSc, PhD,*
***Amirmansour Vatankhah,** BSc, MSc,*
***Abdolnasser Rafi,** MSc, PhD.*

Tuberculosis (TB) is one of the most serious health problems in many countries. In reality

TB is a major cause of mortality and morbidity in the world.[1] It is well known that during TB or other pulmonary inflammations there are increased productions of reactive oxygen and nitrogen species due to phagocytic respiratory burst.[1,2] These induced reactive intermediates can cause an imbalance between the free radical generation and antioxidant defense.[3] Antioxidant deficiency or enhanced reactive oxygen generation has been implicated in the pathogenesis of a variety of human diseases and may promote tissue destruction and inflammation in these patients.[4,5] There is evidence indicating that antioxidants possess anti-inflammatory properties, and their deficiency could lead to oxidative damage of tissues and diseases like degenerative damage, atherosclerosis, atherothrombosis, premature aging, and other neurologic disorders. Malnutrition is another important oxidant parameter in chronic diseases such as TB; it has been suggested as an additional factor to the impaired antioxidant capacity in TB patients and may contribute to the excess oxidative damages.[3,4] The aim of the present study was to determine oxidant and antioxidant statues by determining lipid profiles, malondialdehyde (MDA) as a marker of lipid peroxidation, and total antioxidants (TA) status in patients with active TB.

We studied 45 male patients with a mean age of 39 ± 10.4 years before anti-TB therapy. All of them had active pulmonary TB, and was admitted to the research center for TB and Pulmonary Diseases of Tabriz, Iran within 3 years (2002-2004). Cardiovascular diseases, HIV and smokers were among the exclusion criteria. The control group consisted of 45 Iranian healthy non-smoker men and matched for age (35.4 ± 9.1 years), without history of active TB and apparent atherosclerosis. Conventional laboratory methods for the diagnosis of *Mycobacterium* TB was carried out on all cases using Ziehl-Neelsen staining method for acid-fast microscopy (AFM) and culture of the organism in Lowenstein-Jensen (LJ) medium. All of cases also had chest x-ray in their routine evaluation. After obtaining of oral consent, the patients enrolled into the study. Five ml of venous blood sample were collected from all control group and patients after 10 hours of overnight fasting. After low-speed centrifugation, sera were frozen and kept at -70°C prior to analysis. Serum MDA level, as an index of lipid peroxidation was measured by thiobarbituric acid (TBA) method. Total antioxidant capacity in serum samples was measured by spectrophotometric method (RANDOX Kits-NX2332). The serum levels of cholesterol (Cho), triglyceride (TG) and high density lipoprotein cholesterol (HDL-C) were determined using commercial reagents in an automated chemical analyzer (Cobas Mira, USA) and low density lipoprotein cholesterol (LDL-C) was calculated using the Friedewald equation. The Statistical Package for Social Sciences version 11 was used to perform statistical analysis. Results are presented as mean ± standard deviation. Comparisons were performed with either paired independent-sample t-test or Mann-Whitney U test as appropriate and correlation was evaluated by liner regression. Statistical significance was set at $p<0.05$.

Table 1 compares the result of our findings on the TB cases with controls. The results indicate that there is a significant decrease in serum total antioxidant capacity, and increased MDA concentration in patients ($p=0.002$) when compared with the controls ($p<0.03$). Interestingly a significant negative correlation between MDA and total antioxidant capacity concentration was noticed in our studied patients ($p<0.03$, r=-0.326). As shown in **Table 1** no significant differences were observed in serum Cho ($p>0.4$), TG ($p>0.05$), HDL-C ($p>0.4$) and LDL-C ($p>0.5$) concentrations between patients and control groups.

Tuberculosis remains a major public health problem in developing countries and throughout the world.[1] In tuberculosis, obtained macrophages induce reactive oxygen and nitrogen species, which have a potent antimicrobial property.[1,4] It has been suggested that free radicals released from activated macrophages in addition to low food intake and nutrient malabsorption, all synergistically involve in the generation of oxidative stress in these patients.[2,4] Increasing oxidative stress can adversely affect the immuno response and predisposes the patients to drug toxicity.[3,4] Results of the present study showed

Table 1 - Serum malondialdehyde, total antioxidant, lipid and lipoprotein profiles in tuberculosis patients (N=45) and controls (N=45).

Parameter	Control group (mean ± SD)	TB patients (mean ± SD)	*P*-value
Age (years)	35.4 ± 9.1	39.0 ± 10.4	0.08*
Acid-fast microscopy	-	-	-
Growth on Lowenstein-Jensen	-	-	-
Malondialdehyde (nmol/ml)	2.64 ± 0.75	3.10 ± 1.11	0.03*
Total antioxidant (mmol/ml)	1.46 ± 0.19	1.33 ± 0.19	0.002*
Cholesterol (mg/dl)	174.1 ± 25.2	169.2 ± 30	0.4*
Triglyceride (mg/dl)	132.6 ± 36.3	128.9 ± 89.8	0.05**
HDL-C (mg/dl)	42.5 ± 5.9	41.6 ± 5.4	0.4*
LDL-C (mg/dl)	105.1 ± 21	101.9 ± 28.5	0.5*

TB - tuberculosis, HDL-C - high density lipoprotein - cholesterol, LDL-C - low density lipoprotein - cholesterol
*paired independent-sample t-test, **Mann-Whitney U-test.

that in comparison with the healthy controls group, MDA concentration was significantly high and TA was significantly low in untreated TB patients; but significant differences in serum lipids and lipoproteins levels between the groups were not found. The finding of high serum MDA and low TA status in TB patients fits in very well with the results of other studies performed in Turkey,[5] Ethiopia,[2] India[4] and Africa.[3] These results demonstrate that pulmonary TB is associated with increased oxidative stress and suggest that therapeutic approaches to the prevention of free radical damage such as food fortification and nutritional education programs, as well as appropriate anti-oxidant therapy, may be important to diminish oxidative damage in such patients. The significant inverse correlation between MDA and TA indicates that increased MDA may be considered as a notable factor causing TA reduction in these patients. Due to unchanged levels of lipids profile in such patients, the measurement of oxidized LDL may be helpful in definition of the cause of atherosclerosis in these patients. Further studies with large number of patients are required to confirm the efficacy of antioxidant therapy in the treatment of TB patients.

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From the Research Center for TB and Pulmonary Diseases (Ghorbanihaghjo, Rafi), Drug Applied Research Center (Rashtchizadeh, Rohbaninoubar, Vatankhah), Tabriz University of Medical Sciences, Tabriz, Iran. Address correspondence and reprint requests to: Dr. Amir Ghorbanihaghjo, Research Center for TB and Pulmonary Diseases of Tabriz University of Medical Sciences, Tabriz, Iran. Tel. +98 (411) 3363234. Fax. +98 (411) 3363231. E-mail: ghorbaniamir@hotmail.com

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Epistaxis. *A five-year review*

Fatai Olatoke, *MBBS, FWACS,*
Foluwasayo E. Ologe, *MBBS, FWACS,*
Biodun S. Alabi, *MBBS, FWACS,*
Adekunle D. Dunmade, *MBBS, FWACS,*
Segun S. Busari, *MBBS, FWACS,*
Olushola A. Afolabi, *MBBS.*

A medical emergency deserves appropriate and timely intervention. Epistaxis is one of such emergency seen by Otolaryngologists. Nasal circulation is complex but epistaxis is usually described as either anterior or posterior with anterior epistaxis being common in children and young adults whereas posterior epistaxis is more often seen in older adults and the elderly.[1] Several treatment modalities have been proffered. The introduction of Hopkins rod in the management of epistaxis allows diagnosis and treatment to become more precise. This facility is not available in most centers in Nigeria, and where available cost is a major limitation to its routine use. The treatment frequently offered in major Ear, Nose and Throat (ENT) departments is nasal pack, which has being noted to be simple and cost effective.[2] This paper highlights the burden, which epistaxis constitutes, and how it has been managed over a 5-year period in otorhinolaryngological practice in Ilorin, middle belt region of Nigeria.

This was a retrospective study carried out on patients who presented with epistaxis at the University of Ilorin Teaching Hospital over a 5-year (1999–2003) period. Information on these patients was retrieved from hospital's patients' attendance register and case notes after due permission from relevant hospital authorities. These patients were classified into those who presented at the accident and emergency unit (adult and pediatric), patient who presented at the routine ENT clinic as out patients or referred from other departments. Data extracted included age, gender, causes of epistaxis, treatment offered and other associated ENT presentations. A simple descriptive analysis of the data obtained was carried out.

A total of 1153 cases of adult and pediatric emergencies were seen during the period under review; 342 (29.6%) were aural; 508 (44.1%) were nasal and 303 (26.2%) were throat related. Epistaxis constituted 46.5% of the nasal emergencies while foreign bodies in the nose constituted 20.4%, acute rhino sinusitis 11.2%, cerebrospinal fluid (CSF) rhinorrhea10.2%; nasal furunculosis 9.8% and septal

hematoma/septal abscess 1.9%. Epistaxis accounted for 2.9% of total ENT patients load during the period under review with 73.3% of the cases presenting in the emergency ward as acute bleeding while 26.7% presented in the ENT clinic as chronic or recurrent bleed. The peak age incidence was in the 3rd and 4th decades of life constituting 42.9%. The prevalence in the over 70 years of age was low (4.7%). There was a male to female ratio of 3:2. Trauma was the most common etiological factor (32. 6%). In 17.4% there was associated hypertension. Sino nasal tumor was found in 8.7%, nasopharyngeal tumor 3.7% and bleeding septal polypus 3.1%. Bleeding disorder was noted in 4.4%. No cause of epistaxis was found in 30.1% of the patients. (**Table 1**). Nasal packing was the most frequent modality of treatment; anterior nasal packing was carried out in 27.9% and posterior nasal packing in 3.5%. Other modalities of treatment offered include chemical cautery: Silver nitrate 5.4%, electrical cautery 3.5% and nasal clearance of tumor (8.3%). Adjunct radiotherapy for malignant tumor was given to 3.5% of patients while medical treatment given for underlying disease (6.7%) include whole blood transfusions in 4.8% and nasal decongestants and antibiotics in 23.1%. Approximately 13.5% had more than one form of treatment.

This study showed that nasal pathologies constituted the predominant cases seen at the emergency unit by the Otorhinolaryngologist in this center. Epistaxis alone accounted for almost half of the nasal pathologies. Epistaxis however constituted a small fraction (2.9%) of total ENT emergency cases seen during the same period. Epistaxis is a cause of panic to patients and patient's relations who most of the times have tried various home remedies to stop the bleeding. It was only failure of such efforts that made hospital presentation inevitable.[3]

The predominant age groups affected by epistaxis as shown in this study were 21-30 years and 31-40 years age groups with the condition occurring with least frequency in those above 70 years of age. Similar peak age distribution in epistaxis has been observed in other parts of the country.[2] Patients above 70 years are few in the general population in our environment, considering our current life expectancy.[3,4]

Trauma was the most common etiological factor revealed by this study. This trauma varies from minor injury such as nose picking to varying degrees of nasal injury from road traffic injury.[5] The nose being a prominent feature on the face is highly susceptible in craniofacial injury. Most of our patients with epistaxis from trauma were actually victims of road traffic injury; some of them had accompanying CSF rhinorrhoea.[5] Trauma being the most common cause of epistaxis may be can partly explain the frequency of this problem in males. This group is the adventurous vibrant group in our community. They are often on the road in search of economic well-being as in most African settings males are the breadwinners. Such searches may involve long/short distance journey thereby making them prone to such accidents.

Idiopathic epistaxis was the next most common form of epistaxis. This is in discordance with what was found in the Eastern part of Nigeria where it represented the dominant form.[2] Hypertension as an associated medical condition was noted in 17.4% of our patients; some of these patients were diagnosed for the first time when they presented with severe epistaxis while others were previously known hypertensive patients. Hypertension as a disease is not a primary known cause of epistaxis but it has been observed that when epistaxis occurs in hypertensive patients the bleeding tends to be profuse due to reduced contractile/retractile strength of the tunica media due to atherosclerosis occasioned by the effect of long standing hypertension on this patients.

Sino nasal and nasopharyngeal tumors patients with epistaxis were least seen cases. A good number of other causes of epistaxis such as nasal irritants, crusting from dry weather, recorded in literature[1] were not seen in this study may be as this study was hospital based, and also bleeding from these aforementioned cause is mostly mild and transient.

The management of epistaxis is well summarized in an age-old dictum: resuscitate the patient, establish the bleeding site, stop the bleeding and treat the cause of epistaxis. In clinical setting, what is carried out depends on the state of patient at presentation. Anterior nasal packing with gauzed glove finger packing was the most frequent modality of treatment in this study. This form of treatment was reported as an effective treatment in some centers in Nigeria,[2] although materials used for the packing vary from center to center. The few patients that had postnasal packing

Table 1 - Etiology of epistaxis in the study population

Causes of epistaxis	No. of patients (%)	
Trauma	105	(32.6)
Associated hypertension	56	(17.4)
Sino nasal tumor	28	(8.7)
Bleeding disorder	14	(4.4)
Nasopharyngeal tumour	12	(3.7)
Bleeding septal polypus	10	(3.1)
Idiopathic	97	(30.1)
Total	**322**	**(100)**

were mainly patients with hypertension. They also had anterior nasal packing concomitantly to make the postnasal pack more effective. Complications of nasal packing include septal hematoma, sinusitis, syncope during insertion of nasal pack, pressure necrosis of the alae nasi, toxic shock syndrome. None of our patients suffered this due to adequate precautions such as technique of insertion of the pack, use of antibiotics and nasal decongestant were administered as some of the adjunct treatment to forestall this. Cauterization in the form of electrical cautery (3.5%), and chemical cautery (5.4%) using silver nitrate were carried out for a group of patients where the bleeding points could be identified during examination. Surgery carried out was mainly in form of excision of suspicious area during examination under anesthesia. The specimens were subjected to histology, and where the lesion was malignant a post operative radiotherapy was offered as adjunct.[4] Blood transfusion was administered in only 4.6% of our patients. They were mostly hypertensive patients and victims of road traffic injury who have had significant blood loss before presentation. This percentage although small is of clinical significance when all the risks associated with blood transfusion are considered. In retrospect, a prospective study would have been more appropriate since data excluded on the ground of being incomplete would have been minimized. Also a much larger, multi-center study will give a better evaluation of the burden of epistaxis in Nigeria.

In conclusion, epistaxis constitutes a major ENT emergency in Nigeria; adults are dominant victims. Trauma has been identified as a major cause and insertion of nasal pack plays significant role in the management of these patients. Late presentation and other comorbid conditions may conspire to subjugate efforts of the attending physician.

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From the Department of Otorhinolaryngology, College of Medicine, University of Ilorin, Ilorin, Nigeria. Address correspondence and reprint requests to: Dr. Foluwasayo E. Ologe, PO Box 6641, Ilorin, Nigeria. Tel. +234 (31) 2220769 Ext. 199; 272. Fax. +234 (31) 220020. E-mail: foluologe@yahoo.com

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Treatment of alopecia areata by topical diclofenac sodium gel in comparison to benzoyl peroxide gel. *A novel single blind therapeutic clinical trial*

Khalifa E. Sharquie, *MBChB, PhD,*
Adil A. Al-Nuaimy, *MBChB, DDV, FIBMS,*
Wesam J. Kadhum, *MBChB FIBMS.*

Alopecia areata (AA) is a common skin disease characterized by a rapid onset of non-scarring hair loss in a sharply defined area. Any hair-bearing surface may be affected, especially the scalp.[1] There are many modes of therapy in the treatment of AA including both topical and systemic acting through different mechanisms like non-specific irritants (such as anthralin, garlic, onion and phenol), immune inhibitors (such as topical steroids and psoralen + ultraviolet light A), sensitizers or immune enhancers (such as contact dermatitis induction by dinitrochlorobenzene, squaricacid dibutyl ester and diphenylcyclopropenone) and others like; inosiplex, minoxidil, herbs, vitamin supplement, heat treatment and electrotherapy.[3] Diclofenac sodium is one of the non-steroidal anti-inflammatory drugs. It is used for post-traumatic inflammation of tendons, ligaments, muscles, and joints, also for localized form of soft tissue and degenerative rheumatism.

Benzoyl peroxide is an antibacterial agent, which is effective against *Propionibacterium acnes*. The action is believed to be responsible for its usefulness in acne, and its active ingredient exerts a desquamative and antibacterial action, so it provides mild peeling and keratolytic activity.

The aim of this work is to assess the effectiveness and safety of topical 1% diclofenac sodium gel in comparison with 5% benzoyl peroxide gel in the treatment of AA. This single blind therapeutic clinical trial was conducted in the Department of Dermatology and Venereology in Baghdad Teaching Hospital, Baghdad, Iraq, during the period from December 2003 - October 2004. Fifty-two patients with patchy AA were enrolled in this study, The patients ages ranged between 4-40 years (19.68 ± 11.54 years),

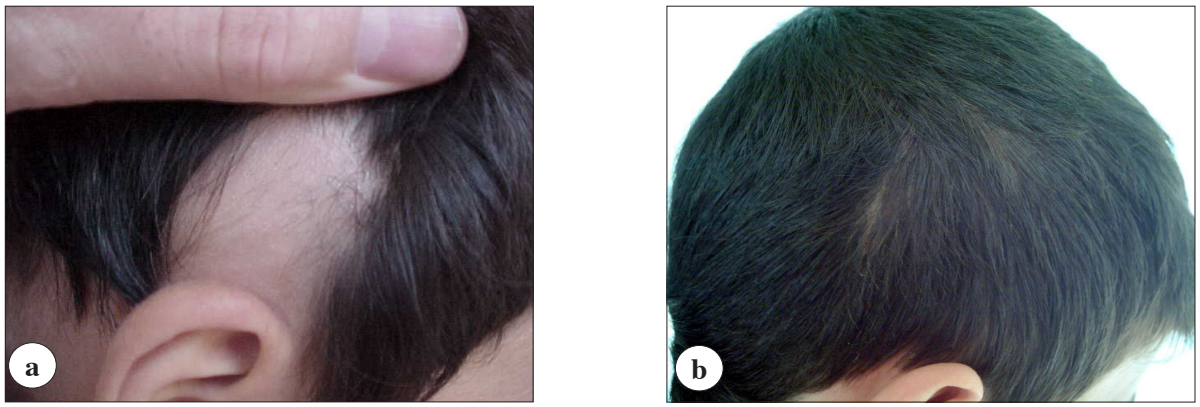

Figure 1 - A patient with alopecia areata treated with diclofenac sodium gel. **a)** Before therapy; **b)** After 2 months of treatment.

while the duration of the disease ranged between 1-12 months (3.53 ± 3.36 months), 30 (57.7%) patients were males and 22 (42.3%) patients were females. Consent was taken from each patient before using the remedy, after a full explanation regarding the method of application, duration and follow up.

A detailed history was taken from each patient regarding the following points: age, gender, address, and duration of the disease. Close physical examination was performed for each lesion including the following aspects: site, size, number, exclamation marks hair and nail changes. We excluded patients with medical problems other than AA, patients with alopecia totalis or universalis, ophiasis and patients who recently received any mode of therapy for the last 2 months. We divided the patients into 2 groups according to the therapy used. Group A consisting of 20 patients with age ranged between 4-40 years (19.68 ± 11.54 years). The duration of the disease ranged between 1-12 months (3.53 ± 3.36 months). A total of 32 patches of AA were recruited. Twelve (60%) patients were having single patch, while 8 (40%) patients have multiple patches. Patients were instructed to apply topical 1% diclofenac sodium gel twice daily for 2 months to all affected patches with gentile massage. Group B consisting of 18 patients with age ranged between 6-44 years (21.3 ± 12.04 years). A total of 26 patches of AA were recruited. Twelve (66.6%) patients were having single patch, while 6 (33.3%) patients were multiple patches. Patients were instructed to apply topical 5% benzoyl peroxide gel in same manner as group A. Follow up was performed every 2 weeks for 4 months. Our patients were evaluated by the patient or patient's relative (in a case of a child) and clinically by looking for any final regrowth that was categorized into 3 groups: The first group, those patches with complete hair regrowth, the second group with partial hair growth, and the third group with no hair growth.

The results of this study showed that 6 in group A, 21 (62.5%) patches showed complete hair regrowth till the end of second month of therapy and one patch showed a relapse at the end of 4 months follow up. While 3 (9.37%) patches revealed partial response at the end of second month of treatment, 2 of them showed complete hair regrowth at the end of 4 months follow up. A total of 22 (65.9%) patches showed complete hair regrowth at the end of 4 months follow up. Nine (28.12%) patches showed no response until the end of this study. In group B, 10 (38.46%) patches showed complete hair regrowth at the end of second month of therapy, 2 of these patches showed a relapse at the end of 4 months follow up. Four patches revealed partial response at the second month of treatment, 2 of them showed complete hair regrowth at the end 4 months study. A total of 10 (38.46%) patches showed complete hair regrowth at the end of 4 months follow up. Twelve (46.16%) patches showed no response until the end of this work. Few and tolerable adverse effects were observed during the course of the treatment of both topical gels, like erythema and itching, but these was resolved spontaneously during the course of the therapy without interrupting the treatment course.

The natural history of AA accounts for the multiplicity of uncritical claims for a large variety of therapeutic procedures, so the range of therapeutic success in AA is so wide, depending on the therapy used and the type of AA.[4] The topical multiple successful therapy lead us to speculate that all of them work through the same mechanism by irritation of the keratinocyte of the hair follicles, and the epidermis to induce the release of immune mediators. These

mediators will regulate the dysregulated immunity, hence, stimulating the arrested growth of hair bulb to regenerate again producing a normal coarse hair, this so called "irritant theory" could be applied to other skin diseases like vitiligo.[5]

The present study using 1% diclofenac sodium and 5% benzoyl peroxide in the treatment of AA, aims to irritate the hair follicles and epidermis to induce hair regrowth. Diclofenac, as the sodium salt, is one of the non-steroidal anti-inflammatory drugs (such as benzene acetic acid derivative, monosodium salt). The present study has proved its effectiveness in the treatment of AA as 21 (65.9%) patches showed complete hair regrowth at the end 4 months of follow up.

While benzoyl peroxide is an antibacterial agent, which has been shown to be effective against *Propionibacterium acnes*. The active ingredient, benzoyl peroxide, exerts a desquamative and antibacterial action. It provides mild peeling and keratolytic activity; the present study using benzoyl peroxide gel in the treatment of AA showed effectiveness in 10 (38.46%) patches that showed complete hair regrowth at the end of 4 months follow up (**Figures 1a & 1b**).

In conclusion, topical 1% diclofenac sodium gel and 5% benzoyl peroxide gel proved to be an effective mode of therapy working probably through their irritant effects in the treatment of AA with minimal side effects, and are comparable to other forms of treatment.[3] Further studies are needed to support the present observation.

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From the Scientific Council of Dermatology and Venereology - Iraqi Board for Medical Specializations (Sharquie), Department of Dermatology and Venereology, University of Baghdad (Al-Nuaimy), Department of Dermatology and Venereology, Baghdad Teaching Hospital, Baghdad, Irag. Address correspondence and reprint requests to: Professor Khalifa E. Sharquie, Chairman of Scientific Council of Dermatology and Venereology - Iraqi Board for Medical Specializations, Medical Collection Office, PO Box 61080, Baghdad 12114, Iraq. E-mail. Ksharquie@yahoo.co.uk

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Evidence of human metapneumovirus infection in Jordanian children

Nasser M. Kaplan, *MBChB, MPhil,*
Winifred Dove, *BSc,* ***Ahmad F. Abu-Zeid,*** *MBChB, JPP,*
Hiyam E. Shamoon, *MBChB, JPP,*
Sawsan A. Abd-Eldayem, *BSc,*
Charles A. Hart, *PhD, FRCPath.*

Acute respiratory infections (ARI) are the most important cause of death in young children, and respiratory syncytial virus (RSV) is the most frequent etiologic agent.

Human metapneumovirus (hMPV) is a paramyxovirus that was first described as a cause of pediatric respiratory tract disease in the Netherlands.[1] Since its initial description, studies across the world have reported that hMPV is responsible for 1.5-25% of ARI,[2] however during epidemics it can represent up to 50% of cases. It seems likely that infection occurs worldwide, and it has now been detected in a wide range of geographic areas with 2 genetic clusters circulating simultaneously. Although hMPV infection has been described in Yemen,[3] there are no systematic data on its frequency and importance as a cause of ARI from other countries in the region. The primary objectives of this study were to detect and evaluate the role of hMPV as an etiologic agent of ARI in hospitalized Jordanian children. This study was approved by the Research Ethics committees of the Royal Medical Services, Amman, Jordan and the University of Liverpool, England, United Kingdom. Between December 2003 and May 2004, children younger than 5 years of age with a clinical diagnosis of ARI admitted to the Pediatrics Departments of King Hussein Medical Center (KHMC) and Queen Alia Hospital (QAH), Amman, Jordan were enrolled, after informed parental consent. King Hussein Medical Center, a tertiary reference hospital, and QAH serve the population of Amman, the capital city of Jordan. All patients admitted were recruited consecutively at the time of consultation, independent of the severity of their illness. The clinical diagnosis of ARI at the time of enrollment was based on the presence of cough, tachypnea, chest indrawing or wheezes for <7 days and the World Health Organization standard protocol for research on ARI. Severe disease was assumed primarily by respiratory rate >60/min and chest wall indrawings. Oxygen saturations (pO_2) were measured by pulse oximetry (Nellcor Puritan Bennett, England; model 195) and pO_2 ≤85% was used as the cut-off point for giving supplemental oxygen.[4] A total of 326 (226 (69%) from KHMC) nasopharyngeal aspirates

(NPA) were collected by direct aspiration with sterile nasopharyngeal mucus extractors, mixed with 1 mL of phosphate-buffered saline and frozen at -80% until analyzed in the Department of Medical Microbiology, University of Liverpool, England, United Kingdom. Ribonucleic acid (RNA) was extracted by the Qiagen RNeasy extraction method (Qiagen, Crawley, United Kingdom). The hMPV genome was detected by reverse transcription-polymerase chain reaction (RT-PCR) amplification using primers amplifying the small matrix (M) gene between nucleotides 212 and 331 giving a 121-bp product, hMPV-MF1 (5'-AAG TGA ATG CAT CAG CCC AAG-3') and hMPV-MR1 (5'-CAC AGA CTG TGA GTT TGT CAA A-3').[5] Using positive and negative controls, and 100-bp molecular ladder, the PCR products were detected by running on 2% agarose gel (Gibco) stained with ethidium bromide in transverse electrophoresis tank, and viewing under ultraviolet light. The hMPV positive by M gene amplification were confirmed by RT-PCR amplification using primers amplifying the large RNA polymerase (L) gene, L6 (5'-CAT GCC CAC TAT AAA AGG TCAG-3') and L7 (5'-CAC CCC AGT CTT TCT TGA AA-3').[6] The L-gene's DNA was purified using the Microspin Sephacryl HR columns (Amersham Biosciences, United Kingdom) and then used for sequencing studies (Lark technologies, Essex, United Kingdom) to confirm identity. Other potential respiratory pathogens including RSV, Influenza A and B viruses, parainfluenza 1-4 viruses, Adenovirus, *Chlamydia* spp and *Mycoplasma pneumoniae* were detected by PCR or RT-PCR according to previously published protocols.

We recruited 326 children (188, 58% male) with a median age of 5 months. The hMPV was detected in 8 (2.5%) children as shown in **Table 1**. The hMPV-affected children had a median age of 6.5 months. This is similar to the age distribution of the patients included in original reports from the Netherlands[1] and elsewhere. The clinical manifestations of hMPV infection are not diagnostically distinctive. They are similar to those of RSV and range from mild upper respiratory infection to bronchiolitis and severe pneumonia requiring mechanical ventilation. All the patients in our study had lower respiratory tract infections mainly bronchiolitis and bronchopneumonia. Neither admission to the intensive care unit nor deaths occurred in our patients. It is not uncommon to have a dual infection of hMPV and another respiratory pathogen.[5] Rates of mixed infections range from 6-39%, with RSV and influenza A being the most common co-pathogens. In our study, hMPV was identified as the sole viral pathogen in 4 (50%) children, and co-infection was detected with Adenovirus in 3 (37.5%) and *Chlamydia* spp in 1 (12.5%). However, there were no children infected simultaneously with both RSV and hMPV.

Although we studied only 6 months of the year, hMPV had a peak in January. This agrees with reports of hMPV having a peak in the first months of the year in the Northern hemisphere and during April and May in the Southern hemisphere.[7] The Jordanian hMPV strains showed 98% identity to each other and were similar to the first described Dutch strains.

This is the first report of hMPV from Jordan and confirms that hMPV is an important causative agent of ARI in hospitalized Jordanian children. The hMPV can cause acute respiratory diseases either alone or in combination with other respiratory pathogens. Further studies are required to characterize the clinical, and epidemiological features of hMPV in Jordan.

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From the Department of Microbiology (Kaplan, Abd-Eldayem), Department of Pediatrics (Abu-Zeid, Shamoon), King Hussein Medical Center, Amman, Jordan and the Department of Medical Microbiology (Dove, Hart), University of Liverpool, England, United Kingdom. Address correspondence and reprint requests to: Dr. Nasser M. Kaplan, Consultant and Head of Microbiology, King Hussein Medical Center, PO Box 140746, Amman, Jordan. Tel. +962 (6) 5821636. Fax. +962 (6) 5820803. E-mail: nassermkaplan@hotmail.com

Table 1 - Comparison of the human metapneumovirus-infected children.

No	Age (months)	Gender	Month	Disease severity	Simultaneous infection
1	24	F	December	Severe	*Chlamydia* spp
2	2.5	F	January	Mild-Moderate	None
3	7	F	January	Severe	Adenovirus
4	6	F	January	Severe	Adenovirus
5	2	M	January	Severe	None
6	10	M	January	Mild-Moderate	Adenovirus
7	27	M	January	Mild-Moderate	None
8	3	M	February	Severe	None

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