Efficacy of Povidone Iodine in Treatment of Active Chronic Suppurative Otitis Media

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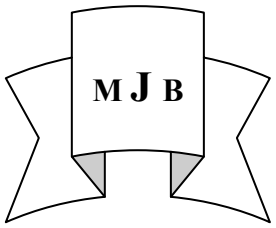


Abstract

This is a double-blind prospective study done in Basarah, in the period from the 1st of February to the 31st of October 2005.

Fourty- eight patients with active chronic suppurative otitis media were included in this study, full history ,otological examination, ear swab for culture were done as well as pure tone audiometry performed before and 2 weeks after treatment. All the studied patients treated systemically by appropriate dose of amoxicillin.

The commonest isolated organism was staphylococcus aureus (25%), followed by pseudomonas aeroginosa and streptococcus pneumoniae (18.7%) for each.

Povidone iodine (betadine) 5%solution, neomycine dexamethason (neodexone) drops and normal saline 9% were used as local therapy (ear drops) randomly for the three equally divided groups of patients.

The use of povidone iodine ear drops associated with 81% complete improvement compared with 69% improvement by neomycin –dexamethason drops and only 25% for normal saline drops, the interesting fact that improvement by the use of povidone iodine occurred earlier than the use of neomycin – dexamethason and normal saline ear drops.

No complication was detected as a result of treatment by any of the above treatment.

الخلاصة

هذه دراسه منظوره على نحو مضاعف تمتفي البصره في الفتره الزمنيه الممتده من الاول من شهر شباط الى الحادي والثلاثين من شهر تشرين اول ٢٠٠٥ .

تضمنت الدراسه ٤٨ مريضا مصابا بالتهاب الاذن الوسطى المزمن الناشط ، وتم اخذ التاريخ المرضي لكل حاله مع الفحص الكامل للاذن ، واخذت مسحات من الافراز الاذني وتمت زراعتها ، مع خضوع كل حاله لفحص السمع قبل العلاج وبعده بفتره اسبوعين، علما ان جميع المرضى عولجوا جهازيا بجرع مناسبه من الاموكسسلين.

تبين ان المكورات العنقوديه الذهبيه هي الاثر شيوعا من العزلات المستحصله (٢٥%) وشكل كل pseudomonas aeroginosa streptococcus pneumoniae من نسبه (١٨,٧%) من العزلات.

لقد استخدم محلول البيتادن (٥%) كقطرات للاذن، وقطرات النيومايسين – دكساميثازون ، وقطرات المحلول الملحي(٩%) ، ووزعت عشوائيا على ثلاثه مجاميع متساويه من المرضى.

ان استخدام محلول البيتادين(٥%) ادى الى تحسن كامل ل(٨١%) من المرضى بينما كان التحسن (٦٩%) للمرضى الذين استخدموا قطرات النيومايسين– دكساميثزون ، واستخدام المحلول الملحي(نورمال سلاين) ادى الى تحسن (٢٥%) من المرضى .

لقد ظهر ان استخدام قطرات محلول البيتادين ادى الى تحسن مبكر للحالات مقارنة بالعلاجين الاخرين .

لم تسجل اية مضاعفات نتيجة لاستخدام اي من العلاجات الثلاثه

Introduction

Chronic suppurative otitis media (CSOM) is a chronic infection of the middle ear, defined as otorrhoea of at least 2 weeks duration in the presence of tympanic membrane performation [1].

Active CSOM forms a major proportion of the clinical work load of an average otolaryngological practice [2].

Ototopical antibiotic treatment is more effective than systemic antibiotic therapy in eliminating otorrhoea in CSOM [2,3,4], probably because irreversible tissue damage and fibrosis caused by infection renders systemic therapy less effective.

Neomycin is particularly valuable against Proteus and Staphylococcus aureus but is ineffective against Gram-negative anaerobes and has limited action against Pseudomonas aeroginosa because of an increasing degree of resistant; the presence of steroid with an antibiotic drop enhances the efficacy of the antibiotic[6].

Iodine has been used as an antiseptic for a long time; the concept of its bactericidal effect was established at the end of 19th century[7]. It is effective against gram-negative, gram-positive and mycobacteria, treponema, fungi, viruses and protozoa[7, 8], its unique biological effect is characterized by the lack of resistance against iodine7. Polyvinylpyrrolidone (Povidone)-bound iodine was developed by the NASA for the Apollo program, and it was first used during the Apollo 11 space travel in 1969[7]. Very soon it was adapted to medicine, to dominate the arsenal of surgical disinfection ever since[7]. By in vivo testing the substance was found to be faster acting and more effective against a large number of pathogens than locally administered combined antibiotics[9]. The formation is suitable to exert its effect also in the presence of blood, serum, proteins and necrotic tissue debris[10].

Aim of the Study

The aim of this study is to throw some light on the efficacy of povidone iodine 5% solution in medical treatment of chronic suppurative otitis media.

Patients and Methods

This is a double blind randomized prospective study, done in otolaryngology department in Al-Jumhori hospital in the period from the 1st of February to the 31st of October 2005.

Forty-eight patients exhibiting otorrhoea-associated recurrent suppurative otitis media with tympanic membrane perforation were included in this study, their ages ranged from 11 to 67 years with mean age of 26 years, more than this number of patients was seen but they excluded because of cholesteatoma, marginal perforation, impending complication, aural polyps, associated otitis externa and children below 10 years. Swabs for culture were taken from all the studied patients, pure tone audiometry also done before and 2 weeks after local treatment.

All the studied patients were treated systemically by the appropriate dose of amoxicillin.

Povidone iodine (5%) solution (Betadine), neomycin-Dexamethason (Neodexon) and normal saline (9%), put in identical bottles, labeled with code number only, were randomly given to the 3 studied groups (each one included 16 patients), the dose was 3 drops, three times daily for 2 weeks, before which they instructed to clean the ear by self-made cotton buds, the patients also informed to prevent water from gaining access into the ear, Assessment was based on symptomatology and examination which is done after the 1st and 2nd weeks of treatment.

I suggest a simple score for assessment of improvement, including

tinnitus, amount of ear discharge, types of discharge, middle ear mucosal congestion and oedema, and hearing threshold represented by air-bone gap. (ABG), completely improved patients should have 8-10 mark, partial improvement 4-7, no improvement 0-3 and worsen condition below 0.

The proposed scoring system

parameters								
Tinnitus	No	2	Decrease	1	Same	0	Increase	-1
Amount of discharge	No	2	Decrease	1	Same	0	Increase or pulsatil	-1
Type of discharge	No	2	Mucoid	1	Mucopus	0	Purulent	-1
mucosal congestion	No	2	Mild	1	Same	0	Increase	-1
Air-bone gap by PTA	Significant decrease	2	Insignificant decrease	1	Same	0	Increase gap	-1

Results

The results of cultures of ear swabs of the studied patients are shown in table I.

Staphylococcus aureus was the commonest organism, observed in 12(25%) patients, followed by pseudomonas and streptococcus pneumonia 9(18.7%)patients for each. In nine patients no growth was detected.

Table I: Types of organism in patients with CSOM

Type of organisms	No.	%
Staphylococcus aureus	12	25
Pseudomonas aeroginosa	9	18.75
Streptococcus pneumonia	9	18.75
Proteus sp	4	8.33
Klebsiella sp	3	6.25
E. coli	2	4.16
No growth	9	18.75
Total	48	100

Table II shows the improvement of CSOM according to different local therapy. Eighty-one percent of those treated by Betadine 5% were improved completely, while only one patient (6%) not improved and no patients underwent worsen in his or her condition, eleven patients who comprises 69% of those used Neodexon drop were completely improved, and 3 patients (19%) partially improved but in only 12% of patients there were no changes in their condition had been occur. Normal saline drop show discouraging result that is only 4 patients (25%) showed complete improvement, but in 10 patients there were no change of their condition (62%).

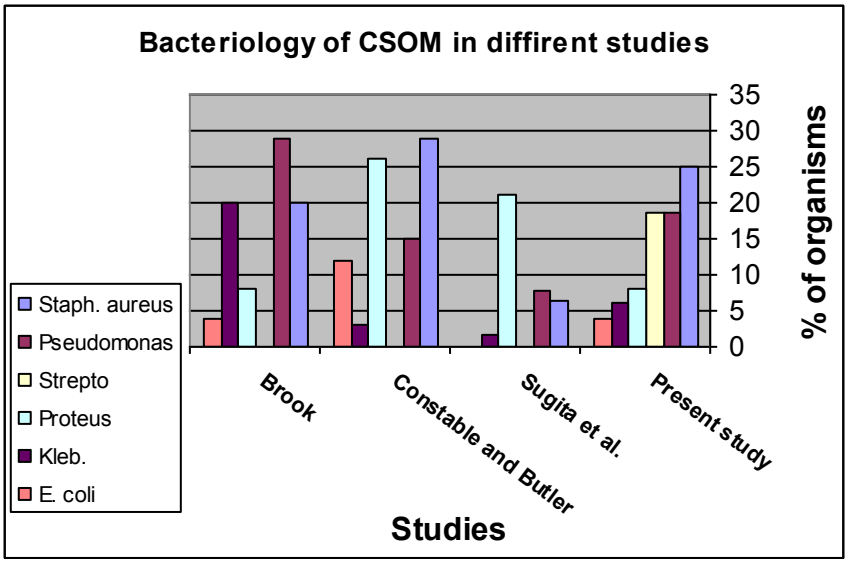
Table II: Improvement according to different type of local therapy

Drug / Improvement	Betadine 5%		Neodexon		Normal saline	
	No.	%	No.	%	No.	%
Completely improved	13	81	11	69	4	25
Partial improvement	2	12	3	19	2	12
Same condition	1	6	2	12	10	62
Worsen condition	0	0	0	0	0	0
Total	16		16		16	

P – Value
Chi - square

Discussion

Histogram I shows the organism cultured in different studies[5] compared to our study. The causes behind negative culture in 9 patients probably due to anaerobic infection, laboratory error or due to antibiotics taken before culture.



Histogram I comparison of bacteriology of CSOM in different studies

Improvement expressed as cure of otorrhoea and middle ear mucosal inflammation[11,12]. The use of povidone iodine (5%) associated with 81% complete improvement(13 patients) after the treatment course, and the interesting fact is that improvement occurred earlier than the use of Neodexon drops and normal saline.

In the present study there was no any signs, symptoms or pure audiometric features of ototoxicity resulted from local betadine therapy which is comparable to Porez et al [13] and Aursenea [14] studies, they showed no any ototoxic effect by the use of povidone iodine (Betadine) solution.
Oberg and Lindsey[15] at 1987 said: Do not put hydrogen peroxide or Povidone iodine into wound because of its cytotoxicity, but really cytotoxic effect was shown only under in vitro conditions[16]. No allergic reaction was reported during the use of povidone iodine solution in this study

which is consistent with the finding of Tosti et al [18] and Okano [19].

In conclusion, local iodine therapy probably highly recommended in medical treatment of active CSOM but this needs further confirmation by other studies.

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