中國醫藥大學 China Medical University

口腔微生物與全身感染: 牙科照護策略的實證探討

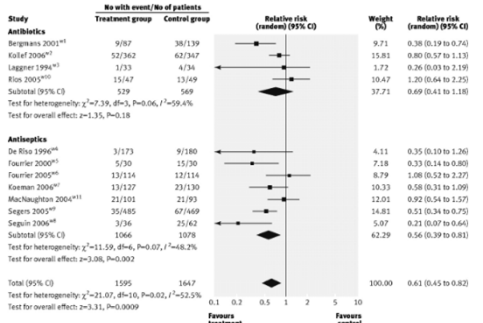
盧敏吉 教授

中國醫藥大學微生物免疫學科

中國醫藥大學附設醫院感染科

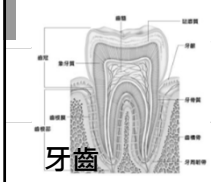
luminchi@mail.cmu.edu.tw

使用CHX確實能有效降低VAP的發生



Forest plot showing effect of oral decontamination prophylaxis compared with no prophylaxis on VAP risk

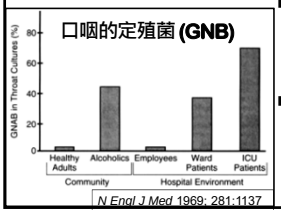
Chan E. Y et al. BMJ 2007;334:889



牙齒

口腔的照護是重要的議題

- 口腔的細菌是
  造成蛀牙與感染的要素!
  定殖菌 *vs.* 致病菌
- 口腔局部感染! 全身感染!
  哪些是重要的致病菌? 造成感染的證據?
- 不同口腔照護方式影響臨床預後? 實證



N Engl J Med 1969; 281:1137

THE LANCET [MARCH 28, 1936

ADDRESSES AND ORIGINAL ARTICLES

ON CERTAIN SEPTICÆMIAS DUE TO ANAEROBIC ORGANISMS *

By A. Lemierre, M.D.

Professor of Bacteriology in the Faculty of Medicine, Paris; Physician to the Claude Bernard Hospital

Lemierre's syndrome

急性口咽感染
合併頸內靜脈敗血性
血栓性靜脈炎
和轉移性感染.

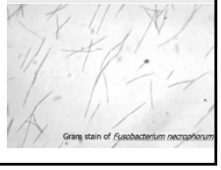
"在出現和重複發燒反應，之前有冷顫發生的喉嚨痛（特別是扁桃腺膿腫），伴隨發作肺梗塞和關節炎表現的綜合病徵....."

Lemierre's syndrome
臨床表現

- 發熱，毒性症狀; 通常是健康的年輕人
- 口咽感染
- 咽喉炎，乳突炎，牙科感染，手術，外傷
- 內頸靜脈血栓通常在口咽感染後4-8天發生
- 腫脹在下頜角
- 大約50%的患者沒有血栓形成
- 膿毒性栓塞來自內頸靜脈靜脈的血栓
- 肺，化膿性關節炎，內臟膿腫，腦膜炎等
- 死亡率：Lemierre描述的系列研究為80%; 在最近的研究為4-12%

致病菌

Fusobacterium necrophorum
most commonly recovered
Peptostreptococcus species
Bacteroides species
Haemophilus aphrophilus



Gram stain of *Fusobacterium necrophorum*

細菌性心內膜炎
MICROBIOLOGY OF NATIVE *vs.* PROSTHETIC VALVE

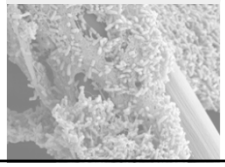
TABLE 1. MICROBIOLOGIC FEATURES OF NATIVE-VALVE AND PROSTHETIC-VALVE ENDOCARDITIS.

PATHOGEN	NATIVE-VALVE ENDOCARDITIS				PROSTHETIC-VALVE ENDOCARDITIS		
	NEONATES	2 MO–15 YR OF AGE	16–60 YR OF AGE	>60 YR OF AGE	EARLY (<60 DAYS AFTER PROCEDURE)	INTERMEDIATE (60 DAYS–12 MO AFTER PROCEDURE)	LATE (>12 MO AFTER PROCEDURE)
	approximate percentage of cases						
Streptococcus species	15–20	40–50	45–65	30–45	1	7–10	30–33
Staphylococcus aureus	40–50	22–27	30–40	25–30	20–24	10–15	15–20
Coagulase-negative staphylococci	8–12	4–7	4–8	3–5	30–35	30–35	10–12
Enterococcus species	<1	3–6	5–8	14–17	5–10	10–15	8–12
Gram-negative bacilli	8–12	4–6	4–10	5	10–15	2–4	4–7
Fungi	8–12	1–3	1–3	1–2	5–10	10–15	1
Culture-negative and HACEK organisms*	2–6	0–15	3–10	5	3–7	3–7	3–8
Diphtheroids	<1	<1	<1	<1	5–7	2–5	2–3
Polymicrobial	3–5	<1	1–2	1–3	2–4	4–7	3–7

*Patients whose blood cultures were rendered negative by prior antibiotic treatment are excluded. HACEK denotes haemophilus species (*Haemophilus parainfluenzae, H. aphrophilus,* and *H. paraphrophilus*), *Actinobacillus actinomycetemcomitans, Cardiobacterium hominis, Eikenella corrodens,* and *Kingella kingae.*

由人工髖關節prosthetic hips分離出產生生物膜(Biofilm)的微生物

Coagulase-negative Staphylococci
Hemolytic streptococci
P. mirabilis
Bacteriodes species
S. aureus
Viridans streptococci
E. coli
P. aeruginosa



血行來源 (20-40%)

- *S. aureus* 菌血症:
  佔有PJI的34%
- **牙齒牙齦感染或局部處理:**
  viridans streptococci & anaerobes
- GU 或 GI 手術或感染:
  GNB, enterococci & anaerobes

Mandell, Bennetand Dolin, Principles and Practice of Infectious Diseases. 6thed. Elsevier, 2005

細菌性心內膜炎 Bacterial Endocarditis Predisposing Factors

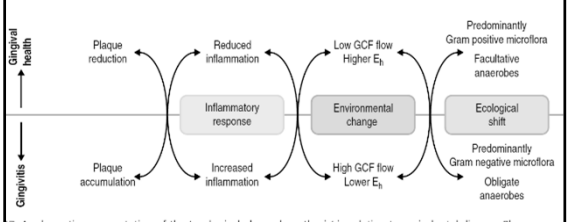
1. 牙科操作
2. 牙齒疾病(齲齒caries, 膿腫abscess)
3. 心臟外感染(肺, 尿道, 皮膚, 骨, 膿腫)
4. 侵入性措施(尿道, 胃腸道, 輸液)
5. 心臟手術
6. 使用注射毒品
7. 沒有明顯的因素

人工關節感染 Prosthetic Joint Infection (PJI) 危險因子

- 皮膚潰瘍、壞死
- 類風濕關節炎
- 之前的臀部、膝蓋手術
- 反覆性泌尿道感染
- 慢性腎功能不全
- 需要化療的腫瘤
- **糖尿病**
- **口服皮質類固醇**
- **拔牙**

Table 6.6 Some of the predominant bacteria that have been commonly cultured from sites with chronic periodontitis in adults

Gram positive	Gram negative
Eubacterium brachy	*Tannerella forsythia*
Eubacterium nodatum	*Fusobacterium nucleatum*
Mogibacterium timidium	*Porphyromonas gingivalis*
Parvimonas micra	*Prevotella intermedia*
Peptostreptococcus stomatis	*Prevotella loescheii*
Parvimonas micra	*Dialister pneumosintes*
	Campylobacter rectus
	Treponema spp.



7 A schematic representation of the 'ecological plaque hypothesis' in relation to periodontal disease. Plaque

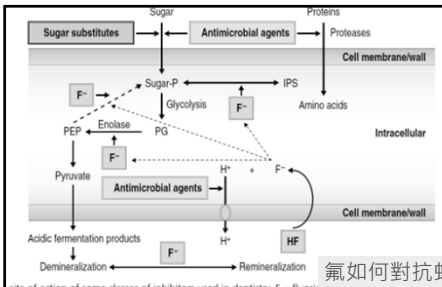
牙周病

- 「牙周」是指「牙齒周圍的組織」，也就是支持牙齒穩固於齒槽骨的組織，包括：牙齦(肉)、牙周韌帶(使牙根附著於牙槽骨的纖維)、齒槽骨、以及牙骨質(覆蓋於牙根表面的鈣化組織， 能使牙周韌帶附著其上)，這四種組織有了毛病便稱為「牙周病」。
- 臺灣地區18歲以上的成年人，牙周病的盛行率達99.1%；定期看牙醫的人卻不到20%。

台灣地區六歲以下兒童蛀牙狀況

年齡	乳牙齲蝕指數	盛行率
1-2	0.23	7%
2-3	1.37	**40%**
3-4	3.18	58%
4-5	4.98	73%
5-6	5.58	74%

資料來源：台灣地區六歲以下兒童口腔健康狀況調查，衛生署，2005 圖表製作：黃耀慧 醫師



site of action of some classes of inhibitors used in dentistry. F = fluoric
rate; PEP = phosphoenolpyruvate

氟如何對抗蛀牙
- 加速牙齒表面再**鈣化**
- 增加牙齒的**抗酸**能力
- **抑制細菌**生長與代謝
- 加速牙齒**表面的成長**過程
- 使牙齒表面**齒溝變淺**

Clinical Infectious Diseases

MAJOR ARTICLE

IDSA Infectious Diseases Society of America | hivma hiv medicine association | OXFORD

Oral Streptococcal Endocarditis, Oral Hygiene Habits, and Recent Dental Procedures: A Case-Control Study

Xavier Duval,[1] Sarah Millot,[2] Catherine Chirouze,[3,4] Christine Selton-Suty,[5,6] Vanessa Moby,[3,4] Pierre Tattevin,[4] Christophe Strady,[7] Edouard Euvrard,[8] Nelly Agrinier,[9] Daniel Thomas,[10] Bruno Hoen,[11,b] and François Alla,[12,b], for the EI-dents Association pour l'Etude et la Prévention de l'Endocardite Infectieuse (AEPEI) Study Group

[1]Inserm CIC-1425, AP-HP, Hôpital Universitaire Bichat; Inserm UMR-1137 IAME; Université Paris Diderot, UFR de Médecine-Bichat, and [2]UMR 1149-Inserm, CRI, Université Paris Diderot, Faculté de médecine Bichat, Paris; [3]UMR 6249 Laboratoire Chrono-environnement Université de Bourgogne Franche-Comté, Service de maladies infectieuses, CHRU Besançon; [4]Centre Hospitalier Régional Universitaire, and [5]Service Odontologie–Centre Hospitalier Régional Universitaire Nancy; [6]Maladies Infectieuses et Réanimation Médicale, Centre Hospitalier Universitaire, Rennes, [7]Cabinet d'Infectiologie, Clinique Saint André-Groupe Courtancy, Reims, [8]Inserm, CIC-1431; Service de Stomatologie, Chirurgie Maxillofaciale et Odontologie Hospitalière, CHRU Besançon; [9]Inserm, CIC-1433 Epidémiologie Clinique, Centre Hospitalier Régional Universitaire, Nancy; [10]AP-HP, Hôpital Pitié-Salpêtrière, Département de Cardiologie, Paris; [11]Université des Antilles et de la Guyane, Faculté de Médecine Hyacinthe Bastaraud, EA 4537; Centre Hospitalier Universitaire de Pointe-à-Pitre, Inserm CIC-1424, Service de Maladies Infectieuses et Tropicales, Dermatologie, Médecine Interne, Pointe-à-Pitre; and [12]Université de Lorraine, Université Paris Descartes, Apemac, EA4360; Inserm, CIC-1433, Nancy, France

Duval et al, CID 2017:64 (15 June) :1678

Background. **We aimed to compare oral hygiene habits, orodental status, and dental procedures in patients with infective endocarditis (IE) in**

背景: 根據引起感染性心內膜炎（IE）的微生物是否起源於口腔，比較IE患者的口腔衛生習慣，口腔狀況和牙科手術方法。

於2008年5月至2013年1月期間，在6家法國三級醫院進行了一項評估員盲法病例對照研究。 口腔衛生習慣是使用自填式問卷記錄。 口腔牙齒的狀態由訓練有素的牙科醫生以盲法分析微生物，使用標準化的臨床檢查和牙科全景成像分析。 牙科程序的歷史是通過患者和牙醫訪談獲得。病例和對照有確定的IE ，在研究過程中一個專家驗證的保密清單，導致的微生物被分類為口腔鏈球菌或非口腔病原體。

streptococci or nonoral pathogens, respectively. Participants were enrolled between May 2008 and January 2013.

Duval et al, CID 2017:64 (15 June) :1678

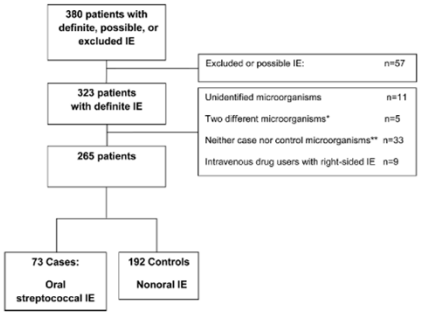


Figure 1. Study flowchart. *Discordant microorganisms: 2 microorganisms responsible for a single infective endocarditis (IE) episode, from 2 different origins.

Duval et al, CID 2017:64 (15 June) :1678

Table 1. Background Characteristics of Case Patients and Control Patients

Characteristic	Whole Population N = 265		Cases: Oral Streptococcal IE n = 73 (27.5%)		Controls: Nonoral IE n = 192 (72.5%)		*P* Value
Age, y, mean (SD)	60.8	(16.7)	65.5	(17.6)	62.8	(15.9)	**.002**
Age ≥65 y	123	(46.4)	21	(28.8)	102	(53.1)	**.001**
Male sex	212	(80.0)	53	(72.6)	159	(82.8)	.063
At least 1 comorbidity	94	(35.5)	15	(20.5)	79	(41.1)	**.002**
Diabetes mellitus	48	(18.1)	9	(12.3)	39	(20.3)	.132
Cancer	41	(15.5)	6	(8.2)	35	(18.2)	.044
Dialysis	5	(1.9)	0	(0)	5	(2.6)	.329
Intravenous drug use	6	(2.3)	0	(0)	6	(3.1)	**.019**
Active smoking	51	(19.8)	15	(21.7)	36	(19.0)	.631
Cardiac history							
Underlying valve disease (HD)							**.014**
Prosthetic valve	67	(25.3)	18	(24.7)	49	(25.5)	
Previously known native HD	76	(28.1)	30	(41.1)	46	(24.0)	
No previously known HD	122	(46.0)	25	(34.2)	97	(50.5)	
Pacemaker and/or implantable cardioverter defibrillator	29	(10.9)	2	(2.7)	27	(14.1)	**.008**
History of IE	21	(7.9)	7	(9.6)	14	(7.3)	.536

Data are presented as No. (%) unless otherwise indicated. Bold indicates statistically significant values.
Abbreviations: HD, heart disease; IE, infective endocarditis; SD, standard deviation.

Duval et al, CID 2017:64 (15 June) :1678

Table 2. Oral Hygiene Habits and Dental Procedures in the Prior 3 Months in Case Patients and Control Patients

Patient Oral Hygiene Habits	Whole Population N = 265		Cases: Oral Streptococcal IE n = 73 (27.5%)		Controls: Nonoral IE n = 192 (72.5%)		*P* Value
Toothbrushing frequency							.623
More than twice daily	37	(16.2)	9	(13.6)	28	(18.1)	
Twice daily	85	(38.5)	28	(42.4)	57	(36.8)	
Once daily	64	(29.0)	20	(30.3)	44	(28.4)	
Less than once daily	21	(9.5)	7	(10.6)	14	(9.0)	
Toothbrushing after meal	124	(54.4)	30	(44.8)	94	(58.4)	**.029**
Interdental hygiene habits							
Toothpick use	64	(29.2)	24	(36.9)	40	(26.0)	.154
Dental water jet use	10	(4.5)	5	(7.6)	5	(3.2)	.194
Flossing	19	(8.6)	11	(16.7)	8	(5.1)	**.011**
Interdental brush use	23	(10.6)	9	(13.4)	14	(9.1)	.274
At least 1 of these behaviors	89	(39.6)	37	(55.2)	52	(32.9	**.006**
Dental procedures							
In the 3 mo prior to IE[a]	23	(8.8)	12	(16.3)	11	(5.8)	**.002**
In the 2 mo prior to IE	19	(7.3)	11	(15.7)	8	(4.2)	**.002**
In the month prior to IE	7	(2.7)	3	(4.2)	4	(2.1)	.393

Data are presented as No. (%). Bold indicates statistically significant values.
Abbreviation: IE, infective endocarditis.
[a]When considering only patients with a predisposing cardiac condition at high risk of IE (prosthetic valve, history of IE, and cyanotic cardiopathy), dental procedures in the previous 3 months were performed in 5.5% of cases vs 1% of controls ($P = .045$); these figures were 12.3% and 1.5% when considering all patients with a IE predisposing cardiac condition ($P < .001$) and 4.6% and 4% in patients without IE predisposing cardiac conditions ($P = 1$).

Duval et al, CID 2017:64 (15 June) :1678

結果: 病例（n = 73）比對照（n = 192）更有可能
年齡<65歲（危險比[OR]，2.85; 95%CI，1.41-5.76），
女（OR，2.62; 95%CI，1.20-5.74），
患有自體瓣膜病（OR，2.44; 95%CI，1.16-5.13），
使用牙籤，牙科噴水器，齒間刷和/或牙線（OR，3.48; 95% CI，1.30-9.32），
在過去的3個月內進行過牙科手術（OR，3.31; 95%CI，1.18-9.29），
而飯後不太刷牙、 牙齦炎症、牙結石和感染性牙齒疾病在組間沒有顯著差異。

結論: 口腔鏈球菌引起IE的患者與非口腔致病菌引起的IE不同背景特點，
口腔衛生習慣，
最近的牙科手術，
但不是當前的口腔牙齒狀態。

Peters et al. BMC Microbiology (2017) 17:157
DOI 10.1186/s12866-017-1064-9

BMC Microbiology

RESEARCH ARTICLE Open Access

The oral fungal mycobiome: characteristics and relation to periodontitis in a pilot study

Brandilyn A. Peters[1], Jing Wu[1,3], Richard B. Hayes[1,2] and Jiyoung Ahn[1,2*]

Background: The oral fungal microbiome (mycobiome) is not well cha ases such as nd compar thout periodontal disease

背景：口腔真菌微生物組（mycobiome）並沒有好的描述，特別是在口腔疾病方面，如牙周病
本篇旨在描述和比較牙周病患者的口腔真菌群

Peters et al. BMC Microbiology (2017) 17:157

Table 2 *Candida* and periodontal disease

	Carriage, %			Relative abundance, median (IQR)		
	Periodontal disease ($n = 15$)	Oral health ($n = 15$)	*P*-value	Periodontal disease ($n = 15$)	Oral health ($n = 15$)	*P*-value
Candida (genus)	100	100	NA	33.2 (0.9, 72.7)	2.2 (0.4, 58)	0.52
Candida albicans (species)	60	53.33	1	7.5e-04 (0, 0.04)	2.87e-04 (0, 0.01)	0.56
Candida dubliniensis (species)	26.67	20	1	0 (0, 1.82e-04)	0 (0, 0)	0.6
Candida parapsilosis (species)	80	86.67	1	1.2e-03 (5.8e-04, 0.1)	7.8e-04 (4e-04, 0.07)	0.69
Candida quercitrusa (species)	86.67	73.33	0.65	7.6e-04 (4.6e-04, 1.9e-03)	4.9e-04 (7.8e-05, 1.2e-03)	0.35
Candida sake (species)	26.67	13.33	0.65	0 (0, 1.2e-04)	0 (0, 0)	0.48
Candida sp. (species)	100	100	NA	5.0 (0.09, 72.2)	0.8 (0.08, 56.7)	0.49
Candida sp._CBS_10854 (species)	6.67	20	0.59	0 (0, 0)	0 (0, 0)	0.28
Candida tropicalis (species)	6.67	20	0.59	0 (0, 0)	0 (0, 0)	0.31

Peters et al. BMC Microbiology (2017) 17:157

Results (1):

結果（1）：
通過對從口腔清洗樣品提取的DNA中的分類學信息性的泛真菌內部轉錄間隔區（ITS）基因測序，對30名成人受試者（15名牙周病患者，15名具有良好口腔健康）的口腔真菌生物學特徵進行研究。
所有樣本中至少有81屬和154種真菌。**念珠菌屬和曲霉屬是最常見的屬（100%的參與者中分離）**，其次是青黴屬（97%），裂褶菌屬（93%），紅酵母屬（90%）和赤黴菌屬（83%）。
念珠菌屬和曲霉屬也是樣品中最高豐度的屬（中值相對豐度分別為21%和44%）。
黑曲霉（Aspergillus niger）是樣品中最高豐度的種類（中值相對豐度= 44%）。
牙周疾病和良好口腔健康的整體口腔菌群多樣性或組成之間沒有顯著差異，也沒有觀察到通過物種水平類群之間的相對豐度或運輸之間兩組之間的顯著差異。

carriage between the two groups.

Peters et al. BMC Microbiology (2017) 17:157

Management of patients with prosthetic joints undergoing dental procedures

Amoxicillin? Minocycline?
.....
Local vs. systemic?

Clinical Recommendation:

In general, for patients with prosthetic joint implants, prophylactic antibiotics are *not* recommended prior to dental procedures to prevent prosthetic joint infection.

For patients with a history of complications associated with their joint replacement surgery who are undergoing dental procedures that include gingival manipulation or mucosal incision, prophylactic antibiotics should only be considered after consultation with the patient and orthopedic surgeon.* To assess a patient's medical status, a complete health history is always recommended when making final decisions regarding the need for antibiotic prophylaxis.

Clinical Reasoning for the Recommendation:

- There is evidence that dental procedures are not associated with prosthetic joint implant infections.
- There is evidence that antibiotics provided before oral care do not prevent prosthetic joint implant infections.
- There are potential harms of antibiotics including risk for anaphylaxis, antibiotic resistance, and opportunistic infections like *Clostridium difficile*.
- The benefits of antibiotic prophylaxis may not exceed the harms for most patients.
- The individual patient's circumstances and preferences should be considered when deciding whether to prescribe prophylactic antibiotics prior to dental procedures.

ADA. Center for Evidence-Based Dentistry™

* In cases where antibiotics are deemed necessary, it is most appropriate that the orthopedic surgeon recommend the appropriate antibiotic regimen and when reasonable write the prescription.

http://jada.ada.org January 2015

Cardiac conditions associated with the highest risk of adverse outcome from endocarditis for which prophylaxis with dental procedures is reasonable.

- Prosthetic cardiac valve or prosthetic material used for cardiac valve repair
- Previous infective endocarditis
- Congenital heart disease (CHD)*
  - Unrepaired cyanotic CHD, including palliative shunts and conduits
  - Completely repaired congenital heart defect with prosthetic material or device, whether placed by surgery or by catheter intervention, during the first six months after the procedure†
  - Repaired CHD with residual defects at the site or adjacent to the site of a prosthetic patch or prosthetic device (which inhibit endothelialization)
- Cardiac transplantation recipients who develop cardiac valvulopathy

* Except for the conditions listed above, antibiotic prophylaxis is no longer recommended for any other form of CHD.
† Prophylaxis is reasonable because endothelialization of prosthetic material occurs within six months after the procedure.

JADA, Vol. 139 http://jada.ada.org January 2008

Dental procedures for which endocarditis prophylaxis is reasonable for patients in Box 3.

All dental procedures that involve manipulation of gingival tissue or the periapical region of teeth or perforation of the oral mucosa.*

* The following procedures and events do not need prophylaxis: routine anesthetic injections through noninfected tissue, taking dental radiographs, placement of removable prosthodontic or orthodontic appliances, adjustment of orthodontic appliances, placement of orthodontic brackets, shedding of primary teeth, and bleeding from trauma to the lips or oral mucosa.

JADA, Vol. 139 http://jada.ada.org January 2008

Primary reasons for revision of the infective endocarditis prophylaxis guidelines.

- Infective endocarditis (IE) is much more likely to result from frequent exposure to random bacteremias associated with daily activities than from bacteremia caused by a dental, gastrointestinal (GI) tract or genitourinary (GU) tract procedure
- Prophylaxis may prevent an exceedingly small number of cases of IE, if any, in people who undergo a dental, GI tract or GU tract procedure
- The risk of antibiotic-associated adverse events exceeds the benefit, if any, from prophylactic antibiotic therapy
- Maintenance of optimal oral health and hygiene may reduce the incidence of bacteremia from daily activities and is more important than prophylactic antibiotics for a dental procedure to reduce the risk of IE

JADA, Vol. 139 http://jada.ada.org January 2008

CHLORHEXIDINE FORMULATIONS Mouthrinses

CHX(洗必泰, 氯己定)口腔沖洗液的形式為0.2%和0.12%。當以相應的相似劑量使用時，0.2%和0.12%的沖洗效果相同。 沖洗時間為30或60秒，取決於消毒劑對口腔表面的吸附速率（50%的CHX在15秒內與受體結合），但情況因個體而異。 在72小時非刷牙期後，使用0.2%CHX的沖洗時間為15、30和60秒，其斑塊抑製作用並沒有明顯差異。 理想的治療方案是每天早晚兩次，作用將持續12小時。

Hoffma... gingiviti... good oral hygiene. *Clin Oral Investig* 2001, *5*: 89–95.
Van de weijden GA, Timmerman MF, Novtny GA, Rosema N, Verkerk A, Three different rinsing times and inhibition of plaque accumulation with chlorhexidine, *J Clin Periodontol* 2005, *32*(1):89-92.

Shruti Balagopal et al /J. Pharm. Sci. & Res. Vol.5(12), 2013, 270 - 274 ISSN:0975-1459 Journal of Pharmaceutical Sciences and Research

Chlorhexidine: The Gold Standard Antiplaque Agent
Shruti Balagopal[1], Radhika Arjunkumar[2]

CHLORHEXIDINE FORMULATIONS Gel 凝膠

氯己定凝膠製劑的可用濃度為1%，0.2%，0.12%，以托盤和牙刷交付。 每天施用一次的氯己定凝膠具有治療效果，例如減少口腔惡臭，並可減少氯己定染色。
牙膏：0.12%的CHX與百萬分之一的氟化物具有類似於CHX**漱口水**的抗斑效果。 然而，將CHX加入**凝膠**和牙膏中存在困難。1%CHX用作液態並每天沖洗一次，持續一分鐘導致牙菌斑和牙齦評分顯著降低，......

Addy M, ... *2000*, 1997 Oct;*15*:52-54.
Dolles, Gjermo, The effects of a chlorhexidine toothpaste on the development of plaque,gingivitis and tooth staining, *J Clin Periodontol*, January 1993, *20*,59-62.

Shruti Balagopal et al /J. Pharm. Sci. & Res. Vol.5(12), 2013, 270 - 274 ISSN:0975-1459 Journal of Pharmaceutical Sciences and Research

Chlorhexidine: The Gold Standard Antiplaque Agent
Shruti Balagopal[1], Radhika Arjunkumar[2]

預防口腔相關感染: 口腔照護

International Dental Journal (2004) **54**, 219–223

The effect of two different dental gels and a mouthwash on plaque and gingival scores: a six-week clinical study

M R Pai, L D Acharya, N Udupa
Karnataka, India

Table 1 The mean baseline plaque and gingival scores and standard deviations for the four study

Group No.	Formulation	No. of subjects	Baseline mean plaque score	Baseline mean gingival score
I	Control (Placebo Gel)	12	1.66 ± 0.39	1.26 ± 0.24
II	Chlorhexidine mouthwash	12	1.62 ± 0.28	1.24 ± 0.19
III	Chlorhexidine - gel	12	1.63 ± 0.30	1.21 ± 0.22
IV	Neem extract- gel	12	1.55 ± 0.25	1.28 ± 0.31

Table 2 The mean 3-week plaque and gingival scores and standard deviations for the four study

Group No.	Formulation	No. of subjects	Mean plaque score	Mean gingival score
I	Control (Placebo Gel)	12	1.43 ± 0.23	1.13 ± 0.26
II	Chlorhexidine mouthwash	12	1.28 ± 0.20[a]	1.05 ± 0.21[a]
III	Chlorhexidine - gel	12	1.11 ± 0.19[a,b]	0.82 ± 0.16[a,b]
IV	Neem extract- gel	12	1.06 ± 0.13[a,b]	0.80 ± 0.24[a,b]

Table 3 The mean 6-week plaque and gingival scores and standard deviations for the four study groups

Group No.	Formulation	No. of subjects	Mean plaque score	Mean gingival score
I	Control (Placebo gel)	12	1.31 ± 0.20	1.150 ± 0.26
II	Chlorhexidine mouthwash	12	0.98 ± 0.20[a]	0.92 ± 0.21[a]
III	Chlorhexidine gel	12	0.62 ± 0.29[a,b]	0.52 ± 0.25[a,b]
IV	Neem extract gel	12	0.63 ± 0.24 [a,b]	0.60 ± 0.28[a,b]

International Dental Journal (2004) 54, 219–223

J Periodontol • September 2009

Clinical, Microbiologic, and Biochemical Effects of Subgingival Administration of a Xanthan-Based Chlorhexidine Gel in the Treatment of Periodontitis: A Randomized Multicenter Trial

Michele Paolantonio,* Simonetta D'Ercole,† Andrea Pilloni,† Domenico D'Archivio,* Luca Lisanti,* Filippo Graziani,§ Beatrice Femminella,* Gilberto Sammartino,‖ Letizia Perillo,¶ Stefano Tetè,# Giorgio Perfetti,# Giuseppe Spoto,** Raffaele Piccolomini,† and Giuseppe Perinetti†††

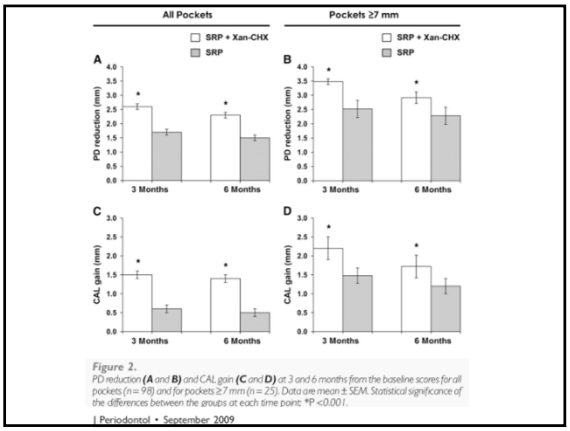
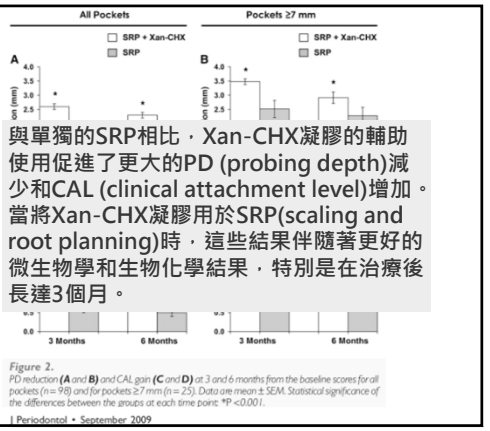


Figure 2.
*PD reduction (**A** and **B**) and CAL gain (**C** and **D**) at 3 and 6 months from the baseline scores for all pockets (n = 98) and for pockets ≥7 mm (n = 25). Data are mean ± SEM. Statistical significance of the differences between the groups at each time point: *P <0.001.*

J Periodontol • September 2009



與單獨的SRP相比，Xan-CHX凝膠的輔助使用促進了更大的PD (probing depth)減少和CAL (clinical attachment level)增加。當將Xan-CHX凝膠用於SRP(scaling and root planning)時，這些結果伴隨著更好的微生物學和生物化學結果，特別是在治療後長達3個月。

Figure 2.
*PD reduction (**A** and **B**) and CAL gain (**C** and **D**) at 3 and 6 months from the baseline scores for all pockets (n = 98) and for pockets ≥7 mm (n = 25). Data are mean ± SEM. Statistical significance of the differences between the groups at each time point: *P <0.001.*

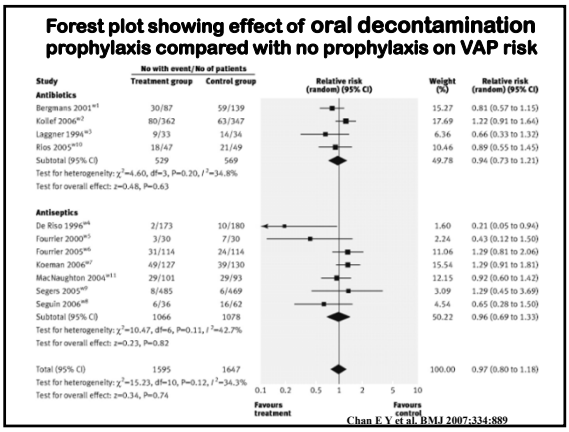
J Periodontol • September 2009

CLINICAL APPLICATIONS OF CHLORHEXIDINE

- 輔助口腔衛生和專業預防
- 牙齦下灌洗
- 治療義齒性口炎，過敏症與\口腔惡臭。
- 全口腔消毒，具有除牙結石和根部規劃
- 用於頜間固定的患者和齲齒高風險的患者
- 在牙周手術或牙根部計劃中進行口腔外科手術: 與刷牙和每日牙線相比，每日使用CHX漱口水結合刷牙可減少鄰間牙菌斑
- 維護牙齒即時功能中的方式: 斑塊和出血指數之間的相關性顯示，每日植入物自我護理使用0.2% CHX凝膠，在6個月時有良好結果
- 易患口腔念珠菌病的高危險患者
- 限制口腔細菌的菌血症和操作性污染，並作為抗生素的輔助手段。

Thank you for your attention!

Forest plot showing effect of oral decontamination prophylaxis compared with no prophylaxis on VAP risk



Chan E Y et al. BMJ 2007;334:889