
THE PAST, PRESENT AND FUTURE OF PERIODONTOLOGY

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**Edited by
P Mark Bartold
T Nagata**

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Acknowledgements

The 10th International meeting of the Asian Pacific Society of Periodontology was held in Nara, Japan on 3 & 4 September 2013. This was a very special meeting for the APSP as it celebrated 20 years since its foundation in 1993. Accordingly, the theme for this meeting was “The Past, Present and Future of Periodontology”. Over 360 delegates from 17 countries attended this APSP meeting. The meeting was opened with an address by Professor Toshihiko Nagata, the President of the 10th Asian Pacific Society of Periodontology Meeting. Additional greetings were presented by Mr Yoshihiro Kaneda, Sunstar Group; Mr Takashi Yamamoto, Lion Corporation and Dr Arunee Laiterapong, Johnson & Johnson Consumer Limited.

The two-day program was very full, with 20 presentations from speakers from 17 different countries. In addition, 78 posters were scheduled for presentation.

Over the two days, 3 keynote speakers, 3 special invited speakers and 12 country representative speakers from the Asian Pacific region presented lectures on a wide range of topics including:

- History of the Asian Pacific Society of Periodontology
- Periodontal treatment strategies
- Periodontal teaching and training
- Periodontal/implant interrelationships
- Tissue regeneration around teeth and implants
- Periodontal bone biology

The poster sessions, sponsored by Sunstar, were very successful and in keeping with tradition from previous meetings, four prizes were awarded for the posters judged to be the best on the day.

This volume serves as a record of all of the presentations made at this meeting. I am sure you will agree with me that each of the chapters is very interesting and represents many contemporary concepts and excellent overviews of the past, present and future of periodontics.

The APSP wishes to acknowledge our sponsors who are listed on the following page. Without this support the 10th APSP meeting and the publication of the proceedings would not have been possible. I would like to acknowledge the contribution of my Co-Editor, Professor Toshihiko Nagata (APSP President, 2013-2015) to the publication of the proceedings. As in previous years, I also thank the presenters for providing their manuscripts for publication. Finally this publication would not have eventuated had it not been for the excellent and efficient production editing of Ms Catherine Offler.

P. Mark Bartold
March 2014



Invited lecturers, left to right:

Shinya Murakami, Jin-Cai Zhang, Young Ku, Yeek Herr, Warwick Duncan, Tara Taiyeb Ali, Nannette Vergel de Dios, Yuniarti Soeroso, Huan-Xin Meng, Toshihiko Nagata, Isao Ishikawa, Li-Jian Jin, Stanley Lai, Yulianti Kemal, Benjamin Tan, Jian-Xia Hou, Kong Mun Chung, Narangsak Laosrisin, Yuichi Izumi, Yosvimol Kuphasuk, Mark Bartold, and AR Pradeep.

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Current Research Activities of Postgraduate Periodontics Programs in Indonesia

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Background

Indonesia, the world's largest archipelago located in Southeast Asia, comprises five main islands: Java, Sumatera, Sulawesi, Kalimantan, and Papua. Indonesia has 26 dentistry faculties; 16 are located in Java, six in Sumatera, two in Sulawesi, one in Bali and one in Kalimantan. At present, out of 26 Faculties of Dentistry, only six offer postgraduate programs in clinical periodontics. Postgraduate programs in clinical periodontics were first offered by Universitas Indonesia, Jakarta in 1984. In the late 80's two other prominent state universities, Gadjah Mada University in Yogyakarta and Airlangga University in Surabaya, commenced their postgraduate programs. Following this, Padjadjaran University in Bandung, Sumatera Utara University in Medan and Hasanudin University in Makasar also started offering programs. Java offers four postgraduate periodontal programs while Sumatera and Sulawesi offer one each.

The Indonesian Medical Council stated there were about 131 registered periodontists responsible for caring for the 250 million inhabitants of Indonesia. Data from the Indonesian Dental Association said that most dentists, especially periodontists, worked in the big cities on Java, such as Jakarta, Surabaya, Yogyakarta, and Bandung, as

well as Medan and Makasar because dental faculties with postgraduate periodontal programs are located in those cities (Dwiati 2013).

Periodontal research, a requirement for postgraduate students, is on the rise. The following data shows periodontal studies carried out during the 2002-2012 period in some postgraduate periodontal programs. 42.5% of studies were on non-surgical therapy, 26.24% examined the correlation between periodontal disease and systemic disease, periodontal regeneration studies comprised 10%, surgical therapy 3.75%, biomolecular research 11.25%, and periodontal lasers were 3.75%.

Periodontal research

There has been a steady progress in periodontal research activities in Indonesia. The various studies in Indonesia universities have been focused on clinical studies relating to etiological factors, risk factors and treatment modalities.

Non-surgical research

Non-surgical research has examined clinical improvement after initial therapy, scaling and root-planing (SRP), use of chemotherapeutic agents and also the

relationship between systemic conditions and periodontal status. The chemotherapeutic agents used for the study are antimicrobial agents, such as tetracycline, minocyclin, doxycyclin, metronidazole, clindamycin, povidone-iodine, chlorhexidine, hyaluronic acid, aloe vera, morinda citrifolia (noni fruit), betel leaf and honey. These agents are used for sub-gingival irrigation, local application as gel or as mouthrinses. The aim of these studies is to evaluate the clinical achievement and improvement after periodontal treatment.

Sub-gingival irrigation with povidone-iodine and tetracycline both result in clinical improvement. Significant reductions in pocket depth (PD), clinical attachment loss (CAL) and papilla bleeding index (PBI) were observed in moderate chronic periodontitis but no significant improvements were seen in either severe chronic periodontitis or aggressive periodontitis (Ervina 2002, Natalina 2002).

Clinical studies of periodontal pocket treatment with gel have been undertaken by postgraduate students. They used gels containing metronidazole, tetracycline, doxycycline or betel leaf. These gels appeared to be effective in reducing PD, PBI and CAL. All subjects had moderate chronic periodontitis with 4 to 6 mm PD. A study with 25% metronidazole gel was carried out in 30 subjects divided into two groups (Suwandi 2003). The first group underwent SRP with application of metronidazole gel and the second group (control group) underwent SRP with 10% povidone-iodine. Bleeding on probing (BOP), PD and CAL were monitored, resulting in significant clinical improvement on day 35. No difference in improvement between groups before day 35 was noted. Gusriani (2005) reported significant improvements in PD, PBI and CAL following the use of 10% doxycycline gel after SRP in moderate chronic periodontitis. Rusminah (2005) reported the efficacy of betel

leaf gel as a conjunctive therapy in the control of clinical parameters (PD, PBI and CAL) in type 2 diabetic patients.

An evaluation of the difference in effectiveness between gingival application of 0.20% hyaluronic acid gel and gingival massage in 96 gingivitis patients indicated the gingival massage group showed better clinical improvement than the hyaluronic acid group (Restuning 2007).

A study to evaluate the efficacy of 25% and 50% aloe vera mouthrinses on periodontal status was undertaken by Napitupulu (2004). An improvement in dental plaque scores and papilla bleeding index following use of aloe vera was reported. The improvements shown in the 25% aloe vera rinse group were better than those in the 50% aloe vera group.

Anggraini (2004) examined a mouthrinse containing morinda citrifolia for improvements in dental plaque scores and papilla bleeding index without scaling and root-planing. This research concluded that scaling and root-planing is still better in reducing gingivitis than rinsing with morinda citrifolia alone when clinical parameters are examined.

Rosmelita (2003) evaluated the efficacy of 0.20% chlorhexidine and diluted 0.20% chlorhexidine 1:1 for gingivitis treatment. Clinical parameter improvement was evaluated after 7 days. Although both groups showed reduced gingivitis and tooth staining, a significant difference was not reported.

Rismanto (2004) evaluated the efficacy of progressive and flexible toothbrushes in reducing tooth staining from 0.2% chlorhexidine. They found that the progressive toothbrush was better than a flexible toothbrush in reducing tooth stain. Adisti (2005) showed the efficacy of a super tapered toothbrush in reducing dental plaque and gingivitis.

The effect of periodontal status on malodour and the reduction of volatile sulphur compounds (VSC) was analysed. Three studies were undertaken; the first evaluated

Authors	Study method	Findings
Suwandi 2002	Experimental clinic 30 subjects, contra lateral quadrant. PPD, BOP and CAL.	Significant clinical improvement on day 35. No difference in improvement between groups before day 35.
Gusriani 2005	Experimental clinic 108 sites. PD, PBI and CAL.	Significant improvement in PD, PBI and CAL following the use of 10% doxycycline gel after SRP in moderate chronic periodontitis.
Rusminah 2005	Experimental clinical study, 26 subjects, split-mouth. PD, PBI, and CAL in type-2 Diabetes mellitus.	Betel leaf gel effective in controlling clinical parameters (PD, PBI and CAL) in type 2 diabetic patients.
Restuning 2007	96 subjects with gingivitis. BOP.	Clinical improvement in two groups. Improvements in the gingival massage group were greater than the hyaluronic acid group.

Table 1. Non-surgical periodontal therapy.

Authors	Study method	Findings
Rismanto 2004	Experimental clinical. 60 subjects. Tooth staining.	Progressive toothbrush is better than flexible toothbrush in reducing tooth staining from 0.2% chlorhexidine rinse.
Adisti 2006	Experimental clinical. 20 subjects. Dental plaque and PBI.	Super tapered tooth brush significantly reduced dental plaque and PBI.
Wijayanti 2007	Experimental clinical. 47 males with chronic periodontitis. VSC rate.	VSC rates thirty minutes after SRP were reduced but not significantly.
Alibasyah 2008	Experimental clinical. 39 subjects. VSC rate.	VSC rate was reduced but not significantly, measured thirty minutes before and after tongue and tooth brushing.
Hartanto 2008	Experimental clinical. 27 subjects. VSC rate.	Reduces VSC rate but no difference in improvement between two groups (tongue brushing with two different dentifrices).

Table 2. Clinical studies: Tooth brushing and halitosis.

Authors	Study method	Findings
Ervina 2002	72 sites, contra lateral quadrant. Periodontal pocket depth (PPD), papilla bleeding index (PBI).	Significantly reduced pocket depth and papilla bleeding index in moderate chronic periodontitis (PD 6-7mm).
Natalina 2002	63 sites, contra lateral quadrant. PPD, CAL.	Significantly reduced pocket depth and clinical attachment loss in moderate chronic periodontitis, except for PD 6 mm .
Rosmelita 2003	99 subjects. BOP and tooth staining.	Correlation between chlorhexidine 0.2% and diluted chlorhexidine 0.2% 1:1 rinse and staining. Although two groups showed reduction in gingivitis and tooth staining, significant differences were not reported.
Napitupulu 2004	120 subjects with gingivitis in anterior teeth. Dental plaque scores and PBI.	Improvement in dental plaque scores and PBI. Improvements in 25% aloe vera rinse group better than 50% aloe vera group.
Angraeni 2004	90 subjects with gingivitis. Dental plaque scores and PBI.	Improvement in the dental plaque scores and PBI without SRP. Clinical parameter improvement after SRP still better than rinsing with morinda citrifolia alone.

Table 3. Studies in antiseptic agents.

Authors	Study method	Findings
Mualim 2002	61 subjects. Glucose level, PPD, PBI, and CAL.	Periodontal debridement significant reduced PPD, PBI, CAL and glucose level in type 2 diabetes mellitus.
Andrena 2007	30 subjects with CHD. Dental plaque (PII) and dental calculus index (CI).	PII and CI in CHD subjects were higher than non-CHD.
Astuti 2009	60 subjects with DM, 53 subjects with DM and CHD.	Periodontal status diabetic patients were better than patients with DM and CHD.
Nasution 2012	16 subjects with CHD. <i>Streptococcus sanguinis</i> levels from dental plaque and saliva.	<i>S. sanguinis</i> levels in CHD group were higher than control group but not significant.

Table 4. Periodontal health status and systemic disease

the relationship between scaling and root-planing with malodour, the second examined the efficacy of tooth and tongue brushing in reducing malodour, and the third studied the efficacy of tongue brushing with two different dentifrices in reducing malodour.

Wijayanti (2007) analysed the VSC rates in 47 adult males with chronic periodontitis. VSC was observed 30 minutes after scaling and root planing. She found that VSC rate was reduced but not significantly.

The efficacy of tongue and tooth brushing in reducing malodour was examined by Alibasyah (2008). In a clinical trial comprising 39 subjects, measurement of VSC rate was performed 30 minutes before and after tongue and toothbrushing. She concluded that VSC rate was reduced but not significant. Hartanto (2008) performed a clinical trial to evaluate VSC rate after tongue brushing using toothpaste containing amilogucosidase and toothpaste containing glucosidase enzyme. 25 subjects, aged 17 to 25 years old were divided into two groups. The first group performed tongue brushing using amilogucosidase toothpaste and the second group performed tongue brushing using glucosidase enzyme. This study showed a reduction in VSC rate but no difference in improvement between the two groups.

Systemic disease and periodontal status research

Systemic disease as a modifying factor of periodontal disease has been established. Postgraduate studies have been undertaken on the association between periodontal disease and systemic diseases. Systemic diseases and systemic conditions examined by postgraduate included type 2 diabetes mellitus, coronary heart disease, human immunodeficiency virus/acquired immunodeficiency syndrome (AIDS), hypertension, gestational diabetic mellitus, postmenopausal women, pregnancy

and low birth weight infants. A case-control study of the effect of scaling and root planing on periodontal status and glucose levels in patients with type 2 diabetes mellitus showed that periodontal debridement significantly reduced papilla bleeding index, pocket depth, attachment loss and glucose levels in diabetic subjects (Mualim 2002). The subjects were 61 diabetic patients and clinical parameters and glucose levels were measured fourteen days following scaling and root planing.

The correlation of coronary heart disease (CHD) with dental plaque and dental calculus accumulation was studied. Andrena (2007) concluded that dental plaque and dental calculus index in CHD subjects were higher than non-CHD patients. Astuti (2011) performed a cross sectional study of 60 diabetes mellitus patients and 53 diabetes mellitus patients with coronary heart disease which showed that the periodontal status of diabetic patients was better than patients with diabetes and coronary disease. Aranti (2011) evaluated dental plaque and calculus accumulation in the same patients as the previous study however there was insufficient data for a definite conclusion. Sumali (2011) evaluated periodontal status in CHD patients with or without hypertension. The subjects were 26 males, aged 35 to 73 years old, suffering from CHD with or without a history of hypertension. The periodontal status between two groups showed no significant difference. Nasution (2012) observed the quantification of *Streptococcus sanguinis* from dental plaque and saliva from subjects with CHD. It showed that *S. sanguinis* levels in the CHD group were higher than in the control group but not significantly.

Research on periodontal status in postmenopausal woman was undertaken by two postgraduate students. Tadjoedin (2009) evaluated the relationship of blood calcium level with periodontal status in 59 postmenopausal women aged 45 to 70

Authors	Study method	Findings
Rachmawati 2010	86 subjects, 2nd and 3rd trimester with hypertension. PD and BOP.	Significantly different periodontal status in pregnant women with hypertension that those without hypertension
Korita 2010	34 subjects with gestational diabetes mellitus. PD and BOP.	Significantly worse periodontal status in GDM than without GDM.
Nasution 2010	70 subjects. Haemoglobin, erythrocyte and leukocyte levels.	Significantly reduced haemoglobin and erythrocyte in pregnant + gingivitis; higher leukocyte in pregnant + gingivitis.
Santana 2010	35 subjects. Levels of haemoglobin, erythrocyte, and leukocyte. CAL.	No significant correlation between haemoglobin, haematocrit and erythrocyte level and CAL in pregnant woman.
Komara 2006	Descriptive analytic.	Periodontitis as independent risk factor of LBW.
Emmanuel 2011	94 subjects. PPD, BOP, CAL.	Significant difference in periodontal health status between mothers of LBW and normal.

Table 5. Periodontal health status, pregnancy and low birth weight.

Authors	Study method	Findings
Rayanti 2008	Descriptive analytic. 30 subjects. Smoking history, bone loss and bone density . Digital radiograph.	No significant correlation between bone loss and bone density with smoking history, duration, quantity, and type of cigarette.
Adriani 2008	Descriptive analytic. 30 subjects. Smoking history, bone loss and bone density. Conventional radiograph.	No significant correlation between bone loss and bone density with smoking history, duration, quantity, and type of cigarette.
Putri 2011	Cross-sectional study. 45 subjects. Low-density lipoprotein (LDL), smoking habit and CAL.	No association between CAL and LDL; between CAL and smoking in CHD patient.

Table 6. Periodontal health status and smoking habit.

Authors	Study method	Findings
Koerniadi 2009	Experimental clinic. 35 sites. Bone level.	Significant increase of alveolar bone height after flap operation (FO) with demineralised freeze-dried bone allograft.
Hartanti 2009	Experimental clinic. 20 samples. FO + demineralized bovine bone powder; FO + Hydroxyapatite β tricalcium phosphate (H β TP); PPD, BOP, CAL, and crestal height of bone (CHB).	Significant differences clinical parameters before and after treatment, but not different between two groups.
Yunanthi 2009	Experimental clinic. 60 samples. FO + DFDBA; FO + demineralized freeze-dried bovine CAL, BOP and CHB.	Significantly improved periodontal parameters. CAL and CHB based at 3 and 6 months differed between two groups; no different for PD and BOP.
Lestari 2010	Experimental clinic. 20 subjects. Dental recession, PD, CAL in coronal position, FO with or without acellular dermal matrix allograft (ADMA).	Significant reduction in recession in type 1 and 2 gingival thickness.

Table 7. Periodontal regeneration therapy.

years. This study showed no significant correlation between blood calcium levels and gingival index, periodontal pocket depth and attachment loss. Wulandari (2009) evaluated the periodontal status and oestrogen levels in the same cohort. There was no significant correlation between oestrogen level and gingival index, periodontal pocket depth or loss of attachment.

The correlation of pregnancy with periodontal status, gingival status, or anaemia status by blood test was studied by four postgraduate students.

Periodontal regeneration and biomolecular research

Biomolecular research in current postgraduate programs include examining MMP8 expression as a risk factor for aggressive periodontitis, RANKL (receptor activator-

kappa β ligand) expression in periodontal defect treatments with xenograft and PRF, and the correlation between periodontal inflamed surface and HbA1c levels in type 2 diabetes mellitus.

Discussion

At present some collaborative research with national and international institutions is occurring, although sometimes the funds available are not enough to cover advanced research. Materials are often difficult to obtain, because of the need to order from overseas and the high cost.

Some of the topics of ongoing research about periodontal regeneration correlated with minocycline; effectiveness of minocycline on red bacterial complexes: *Porphyromonas gingivalis*, *Treponema denticola*, *Tannerella forsythensis*; the relationship of smoking

to human β -defensin, IL-1, IL-4, and *Porphyromonas gingivalis* levels; bone morphogenetic protein in chronic and aggressive periodontitis; and periodontal health status in dental implants.

Conclusion

Current periodontal research in Indonesia focuses on non-surgical and surgical periodontal therapy, correlations between periodontal disease and systemic disease, biomolecular research, periodontal regeneration, periodontal epidemiology and the use of lasers in periodontics. Progress in periodontal research can be assisted by national and international funding.

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