

MEDLARS BIBLIOGRAPHY

PUBLICATIONS OF RELEVANCE TO PAPUA NEW GUINEA AND MELANESIA

Bibliographic Citation List generated from MEDLARS

- 1 **Alexander E Jr.**
World War II: a neurosurgeon in New Guinea.
Neurosurgery 1999 Dec;45(6):1454-1459;
discussion 1459-1460.
During World War II, many doctors joined the military after completing their medical training. Civilian careers were put on hold until after the war was over. In 1942, Eben Alexander, Jr., joined the Air Force, then the United States Army, and served 4 years, much of it overseas, as a '3131C' neurosurgeon.
- 2 **Alpers MP.**
Research and development.
PNG Med J 1997 Sep-Dec;40(3-4):115-118.
- 3 **Amoa AB, Klufio CA, Arua S, Kariwiga G, Wurr F.**
A case-control study of primary caesarean section at the Port Moresby General Hospital, Papua New Guinea, to identify epidemiological predictors of abdominal delivery.
PNG Med J 1997 Sep-Dec;40(3-4):119-126.
A retrospective study of 274 consecutive primary caesarean sections and 274 unmatched controls was carried out at Port Moresby General Hospital from January to December 1992. The primary caesarean section rate was 3.5%. Stepwise logistic regression analysis showed that primary caesarean section was significantly associated with maternal height of less than 150 cm; nulliparity; symphysis-fundal height of more than 38 cm at admission in labour; cervical dilation of less than 4 cm at admission in labour; and the level of fetal head at admission in labour of 3/5 or higher.
- 4 **Amoa AB, Klufio CA, Wat S, Kariwiga G, Mathias A.**
A retrospective survey of patients with one previous caesarean section delivered at the Port Moresby General Hospital: a comparative study of those delivered vaginally and those delivered by repeat caesarean section.
PNG Med J 1997 Sep-Dec;40(3-4):127-135.
We studied 510 patients in a retrospective, nonrandomized, comparative survey of vaginal births and repeat caesarean section after one primary caesarean section at the Port Moresby General Hospital. 478 (94%) were allowed a trial of scar (TOS). The most common indications for elective caesarean section in the other 32 patients were cephalopelvic disproportion (CPD) 31%, contracted pelvis 19% and preeclampsia 12.5%. In 41% of patients TOS was terminated by emergency caesarean section. Logistic regression analysis showed that the following were significantly associated with repeat caesarean section after TOS: parity of one, no vaginal birth after the primary caesarean section, narrow obstetric conjugate, birthweight of 2500 g or greater, short stature, high level of the head at admission to the labour ward and region of origin.
- 5 **Bandara KM.**
Oral health status of students at the age of 12-15 years in Southern Highlands Province of Papua New Guinea: results of a descriptive epidemiological study.
PNG Med J 1997 Sep-Dec;40(3-4):150-156.
A sample of 555 students from three geographically and socioculturally different areas within the Southern Highlands Province, between the ages of 12 and 15 years, was examined in June 1995 to assess the oral health status for planning, monitoring and evaluation purposes. The prevalence of dental caries was found to be 57%, with a DMFT (decayed, missing and filled teeth) score of 1.70 (\pm 2.25) with DT, MT and FT scores of 1.47, 0.12 and 0.10 respectively. 54% of students had active caries and 27% had a DMFT score more than 3. Gingivitis was prevalent among students and visible calculus was present in 35% of them. Only 29% were dentally fit and did not need treatment. About 3% needed some form of orthodontic treatment, and endodontic and cosmetic treatment were respectively needed in 3.5% and 2% of the children.
- 6 **Bastien P.**
More on malaria mortality in the Pacific.
Parasitol Today 1999 Apr;15(4):167-168.
- 7 **Bermejo A, Leonce S, Cabedo N, Andreu I, Caignard DH, Atassi G, Cortes D.**
Semisynthesis and cytotoxicity of styryl-lactone derivatives.
J Nat Prod 1999 Aug;62(8):1106-1109.
The cytotoxicity and the cell-cycle action of altholactone (1), goniofufurone (2), and eight altholactone derivatives (5-12), were determined in vitro on L-1210 cells. Semisyntheses and structure-activity relationships of these compounds are described. The results of this study suggest that the cytotoxicity of altholactone (1), 11-nitro-altholactone (8), and 7-chloro-6,7-dihydroaltholactone (10) is due to the accumulation of the cells in the G2 + M phase of the cell cycle.
- 8 **Bockarie MJ, Alexander ND, Kazura JW, Bockarie F, Griffin L, Alpers MP.**
Treatment with ivermectin reduces the high prevalence of scabies in a village in Papua New Guinea.
Acta Trop 2000 Feb 25;75(1):127-130.

- 9 **Bockarie MJ, Gbakima AA, Barnish G.**
It all began with Ronald Ross: 100 years of malaria research and control in Sierra Leone (1899-1999). *Ann Trop Med Parasitol* 1999 Apr;93(3):213-224.
It was in Sierra Leone, 100 years ago in 1899, that human malarial parasites were first observed in wild-caught *Anopheles gambiae* and *An. funestus*, the principal vectors of malaria in Africa. In the same year, Ronald Ross initiated the first antilarval measures for malaria control. This paper reviews 100 years of malaria field research and control in Sierra Leone, which became known as the 'White Man's Grave' in the 19th century largely because of the high malaria-related mortality amongst Europeans living there. The establishment of a field laboratory for the Liverpool School of Tropical Medicine in Freetown in 1920 made Sierra Leone the centre for malaria field research in Africa up to and during the Second World War. Eminent malariologists including Ronald Ross, Samuel Christophers, George Macdonald, Leonard Bruce-Chwatt, Brian Macgrath, Ian Macgregor, Brian Greenwood and Michael Service visited Sierra Leone for malaria-related activities. This review highlights the tremendous efforts made towards defining the epidemiological picture of the disease and the most effective means of combatting it. Malaria control in Sierra Leone, as in many other parts of the world, used to be based largely on mosquito eradication. However, experience gained over the past 100 years has shown that mosquito control is often not cost-effective in areas where the interruption of transmission cannot be sustained. Emphasis should now be on early diagnosis, treatment with effective antimalarials, and the selective use of preventive measures including vector control and insecticide-treated materials where they can be sustained.
- 10 **Bruce MC, Donnelly CA, Alpers MP, Galinski MR, Barnwell JW, Walliker D, Day KP.**
Cross-species interactions between malaria parasites in humans. *Science* 2000 Feb 4;287(5454):845-848.
The dynamics of multiple *Plasmodium* infections in asymptomatic children living under intense malaria transmission pressure provide evidence for a density-dependent regulation that transcends species as well as genotype. This regulation, in combination with species- and genotype-specific immune responses, results in nonindependent, sequential episodes of infection with each species.
- 11 **Campbell Falck D, Thomas T, Falck TM, Tutuo N, Clem K.**
The intravenous use of coconut water. *Am J Emerg Med* 2000 Jan;18(1):108-111.
Medical resources routinely used for intravenous hydration and resuscitation of critically ill patients may be limited in remote regions of the world. When faced with these shortages, physicians have had to improvise with the available resources, or simply do without. We report the successful use of coconut water as a short-term intravenous hydration fluid for a Solomon Island patient, a laboratory analysis of the local coconuts, and a review of previously documented intravenous coconut use.
- 12 **Coleman JE, Van Soest R, Andersen RJ.**
New geodiamolides from the sponge *Cymbastela* sp. collected in Papua New Guinea. *J Nat Prod* 1999 Aug;62(8):1137-1141.
Geodiamolides J-P (11-17) and R (19), eight new cyclic depsipetides, have been isolated from the marine sponge *Cymbastela* sp. collected in Papua New Guinea. The serine residue in geodiamolides L-P (13-17) and R (19) has not been previously found in this family of compounds.
- 13 **Currie BJ, Fisher DA, Howard DM, Burrow JN, Selvanayagam S, Snelling PL, Anstey NM, Mayo MJ.**
The epidemiology of melioidosis in Australia and Papua New Guinea. *Acta Trop* 2000 Feb 5;74(2-3):121-127.
Melioidosis was first described in Australia in an outbreak in sheep in 1949 in north Queensland (22 degrees S). Human melioidosis was first described from Townsville (19 degrees S) in 1950. Melioidosis is hyperendemic in the Top End of the Northern Territory (NT) and as in parts of northeastern Thailand it is the commonest cause of fatal community-acquired septicemic pneumonia. In the 9 years since 1989 the prospective NT melioidosis study at Royal Darwin Hospital (12 degrees S) has documented 206 culture-confirmed cases of melioidosis, with an average annual incidence of 16.5/100,000. Melioidosis is also seen in the north of Western Australia and north Queensland, including the Torres Strait Islands, but is uncommon in adjacent Papua New Guinea. Serological studies suggest that infection is rare in the Port Moresby region, but there is emerging evidence of melioidosis from Western Province. The NT study has documented inoculating events in 52 (25%) of cases, with an incubation period of 1-21 days (mean 9 days); 84% of cases had acute disease from presumed recent acquisition and 13% had chronic disease (sick, > 2 months). In 4% there was evidence of possible reactivation from a latent focus; 28 of 153 (18%) males had prostatic abscesses. The overall mortality was 21% (43 cases), with a mortality rate in septicemic cases (95) of 39% and in non-septicemic cases (103) of 4%. Pneumonia was the commonest presentation in both groups and, in addition, eight patients (two deaths) presented with melioidosis encephalomyelitis. Melioidosis clusters in temperate Australia are attributed to animals imported from the north. Molecular typing of *Burkholderia pseudomallei* isolates from temperate southwest Western Australia showed clonality over 25 years. In this outbreak and in studies from the NT, some soil isolates are molecularly identical to epidemiologically related animal and human isolates. Molecular typing has implicated the water supply in two clonal outbreaks in remote Aboriginal communities in northern Australia. Further prospective collaborative studies are

required to evaluate whether there are truly regional differences in clinical features of melioidosis and to better understand how *B. pseudomallei* is acquired from the environment.

14 **Dubey SP, Garap JP.**

Paediatric tracheostomy: an analysis of 40 cases. *J Laryngol Otol* 1999 Jul;113(7):645-651.

Tracheostomy in the paediatric patient has been associated with significant morbidity and mortality compared to that in the adult. A retrospective analysis was made of 40 patients up to the age of 12 years having tracheostomies. Upper airway obstruction made up the commonest (32 patients, or 80 per cent) indication for paediatric tracheostomy in our series, where males slightly outnumbered females. The majority (31 patients, or 77.5 per cent) underwent the operation under general anaesthesia with endotracheal intubation. 34 (85 per cent) patients underwent 'planned' tracheostomies and 6 (15 per cent) underwent 'crash' procedures. 13 (32.5 per cent) patients were under the age of one year when tracheostomies were performed. The maximum duration of tracheostomies was between one week to within a month and after one month to within three months; each containing 11 (27.5 per cent) patients. 64 different surgical procedures were performed on these patients in which laryngoscopy and bronchoscopy were the commonest procedures. 9 (22.5 per cent) had early post-operative and 14 (35 per cent) had late post-operative complications. Among these 40 children with tracheostomies, 1 (2.5 per cent) died due to a tracheostomy-related cause and 10 (25 per cent) due to the primary disease process itself. Tracheostomies performed to provide access for general anaesthesia for other surgical procedures were associated with a better prognosis.

15 **Dubey SP, SenGupta SK, Kaleh LK, Morewaya JT.**

Adult head and neck lymphomas in Papua New Guinea: a retrospective study of 70 cases. *Aust NZ J Surg* 1999 Nov;69(11):778-781.

BACKGROUND: During a 10-year period (1986-95), 70 adult Papua New Guineans with head and neck lymphomas were seen in the 18 years-and-above age group. **METHODS:** The clinical information was obtained from the medical records section of the Port Moresby General Hospital. Relevant treatment modalities and the follow-up data were acquired from the National Cancer Centre, Angau Memorial Hospital, Lae. **RESULTS:** Of a total of 227 adult lymphomas recorded in a 10-year period, 70 cases were seen in the head and neck region. Non-Hodgkin's lymphoma constituted 56 cases, which included 7 cases of adult Burkitt's-like lymphoma. 14 cases of Hodgkin's lymphoma were recorded. **CONCLUSIONS:** In Papua New Guinea, malignant lymphomas primarily affecting the head and neck region were seen in 30.8% of all lymphomas. This constitutes 2.8% of all malignancies in this region. These lymphomas appear to be more aggressive at this site. Proper

tissue diagnosis and combination chemoradiotherapy are the key factors in its management.

16 **Dulhunty JM, Yohannes K, Kourleoutov C, Manuopangai VT, Polyn MK, Parks WJ, Bryan JH.**

Malaria control in central Malaita, Solomon Islands. 2. Local perceptions of the disease and practices for its treatment and prevention. *Acta Trop* 2000 Mar 25;75(2):185-196.

Government health policy for malaria control in Solomon Islands has three main objectives: (1) early diagnosis and treatment of malaria at a health service; (2) reduction of human-vector contact through widespread use of insecticide-impregnated bed nets; and (3) provision of malaria chemoprophylaxis for pregnant women. Social research was carried out in thirteen villages in central Malaita to determine local attitudes toward malaria and to estimate the level of participation in malaria control activities. Interviews with 124 care-givers who had children 0-10 years of age, 20 focus group discussions and four evening structured observations were research methods used. Antimalarial drugs were the most favoured treatment, and use of traditional medicines and healers were reportedly minimal. 25% of respondents reported keeping chloroquine at home and 42% said they would use chloroquine before seeking diagnosis and treatment from a health service. Structured observations suggest that protection against mosquitoes is poor during the evening. 52% of respondents reported using fire and 32% said they used bed nets to protect themselves from mosquitoes. Participants had contradictory beliefs on the threat of malaria during pregnancy and the safety of taking chloroquine prophylaxis. Implications of malaria treatment and prevention practices are discussed, and recommendations for improving malaria control are presented.

17 **Eckart WU.**

[German New Guinea: "Grave of the white man". Early malaria reports in the Deutsche Medizinische Wochenschrift].

Dtsch Med Wochenschr 1999 Nov 19;124(46):1389-1391.

18 **El Rashidy H, Boxshall GA.**

Ergasilid copepods (Poecilostomatoida) from the gills of primitive Mugilidae (grey mullets). *Syst Parasitol* 1999 Mar;42(3):161-186.

All representatives of the subfamily Agonostominae of grey mullets in the collections of The Natural History Museum in London were examined for parasitic copepods. *Agonostomus monticola*, *Joturus pichardi*, *Aldrichetta forsteri* and *Cestraeus goldiei* were all infected by copepods. Three new species of *Acusicola* and two new species of *Ergasilus* were found: *E. parabahiensis* n. sp. on *A. monticola* from Guyana and *E. acusicestraeus* n. sp. on *C. goldiei* from Papua New Guinea. *Acusicola spinuloderma* n. sp. was found on *A. monticola* and *J. pichardi*

collected from different localities in Central America, *A. mazatlanensis* n. sp. on the same host from west Mexico (Mazatlan) and *A. joturicola* n. sp. on *J. pichardi* from Panama. Descriptions of the five new species and a redescription of *E. australiensis* Roubal, from *Aldrichetta forsteri*, are presented. The host-parasite relationships and geographical distributions of hosts and their parasitic copepods are analysed.

19 **Elm J, Desowitz R, Diwan A.**

Serological cross-reactivities between the retroviruses HIV and HTLV-1 and the malaria parasite *Plasmodium falciparum*. *PNG Med J* 1998 Mar;41(1):15-22.

Serum samples from three populations of Papua New Guinea, where *Plasmodium falciparum* malaria and human T-lymphotropic virus type 1 (HTLV-1) are coendemic at high prevalence rates, showed statistically significant ELISA co-seropositivity and co-seronegativity. Cross-reactivity was further indicated by the presence of 10 bands ranging from 134 kDa to 18 kDa on immunoblots of electrophoresed whole lysate *P. falciparum* antigen against serum of HTLV-1 seropositive patients from an area where malaria is not present. Similarly, sera from patients positive for human immunodeficiency virus (HIV) from a non-malarious region produced immunoblot bands ranging from 134 kDa to 33 kDa to the *P. falciparum* antigen. The HTLV-1 and HIV serum samples yielded a number of immunoblot bands when reacted to an electrophoresed human O type red cell membrane antigen, but those bands had no identity to the cross-reactive bands on the *P. falciparum* antigen immunoblots. Malaria-positive sera from Papua New Guinean subjects presumed to be uninfected with HIV produced a variety of bands, some of intense prominence, to HIV antigen on diagnostic Western blots.

20 **Engelbrecht F, Togel E, Beck HP, Enwezor F, Oettli A, Felger I.**

Analysis of *Plasmodium falciparum* infections in a village community in Northern Nigeria: determination of msp2 genotypes and parasite-specific IgG responses. *Acta Trop* 2000 Jan 5;74(1):63-71.

The genetic diversity of *P. falciparum* and multiplicity of infection has been studied in a village in Northern Nigeria at the end of the rainy season, when transmission is high. We analysed blood samples from 104 individuals aged 5-70 years by polymerase chain reaction (PCR) amplifying the gene for the merozoite surface protein MSP2 followed by genotyping based on restriction fragment length polymorphism (RFLP). 94.2% of all samples were parasite positive by PCR and over 80% of those had multiple infections. The age distribution of the average number of parasite clones present in *P. falciparum* infections showed an initial increase, then reached a peak multiplicity in children 8-10 years of age, and afterwards decreased significantly with age. Mean multiplicity in those 8-10-year-old children was 5.4 clones per carrier. Peak multiplicity and

parasite diversity in Nigerian individuals is compared to findings from other study sites in Africa and PNG. The prevalence of IgG antibodies against the circumsporozoite protein (CSP), an indicator for malaria exposure, was over 85% in all age groups showing a high exposure of villagers to *P. falciparum*. OD values in ELISA were positively correlated with age. There was no correlation between the level of IgG against CSP and the multiplicity of *P. falciparum* infections determined by PCR of msp2. These results imply that in highly endemic areas multiplicity of infection is not directly correlated with exposure to *P. falciparum*.

21 **Erasmus RT, Lavu EK, Savory J, Wills M.**

Hypokalaemic paralysis associated with renal tubular acidosis. *PNG Med J* 1997 Sep-Dec;40(3-4):173-176.

22 **Frances SP, Cooper RD, Popat S, Sweeney AW.**

Field evaluation of the repellents deet, CIC-4, and AI3-37220 against *Anopheles* in Lae, Papua New Guinea. *J Am Mosq Control Assoc* 1999 Sep;15(3):339-341.

The repellents diethylmethylbenzamide (deet), (2-hydroxymethylcyclohexyl) acetic acid lactone (CIC-4), and 1-(3-cyclohexen-1-yl-carbonyl)-2-methylpiperidine (AI3-37220) were compared for their effectiveness in protecting 5 soldiers against the bites of *Anopheles* spp. at a village in Papua New Guinea. All 3 repellents, applied as 25% ethanol concentrations, provided 95% protection or greater against primarily *An. farauti* 4 for at least 3 h after application.

23 **Hetzel BS.**

Iodine and neuropsychological development. *J Nutr* 2000 Feb;130(2S Suppl):493S-495S.

The establishment of the essential link among iodine deficiency, thyroid function and brain development has emerged from a fascinating combination of clinical, epidemiologic and experimental studies. The central human phenomenon that focuses this relationship is the condition of endemic cretinism, described from the Middle Ages and characterized in its fully developed form by severe brain damage, deaf mutism and a spastic state of the hands and feet. The demonstration of the prevention of cretinism in a double-blind controlled trial with injections of iodized oil in Papua New Guinea (1966-1970) established the causal role of iodine deficiency in cretinism by an effect on the developing fetal brain. Cretinism could not be prevented unless the iodized oil was given before pregnancy. Iodine deficiency is now regarded by the WHO as the most common preventable cause of brain damage in the world today, with at least 30 million suffering from this preventable condition. Since 1986 the international NGO, the International Council for Control of Iodine Deficiency Disorders, has worked closely as an expert group with WHO and UNICEF in assisting countries with a program of universal salt iodization for the

elimination of iodine deficiency as a cause of brain damage by the year 2000. In 1996, WHO reported that 56% of the population of 83 developing countries now had adequate access to iodized salt. This represents an increase of 750 million since 1990 with protection of 12 million children.

24 **Hombhanje FW, Kereu RK.**

In vitro susceptibility of *Plasmodium falciparum* isolates to halofantrine in the Central Province of Papua New Guinea.

PNG Med J 1998 Mar;41(1):30-36.

Halofantrine is a newer antimalarial drug which has not been approved for clinical use in Papua New Guinea. We assessed 21 Central Province isolates of *Plasmodium falciparum* for their in vitro susceptibility to halofantrine. The concentration required to inhibit 50% of parasite growth (IC50) ranged from 0.05 to 7.0 nM with a mean of 1.90 nM and a median of 1.50 nM. The minimum inhibitory concentration (MIC) values ranged from 2.5 to 50 nM with a median of 5.0 nM. All but one isolate had an MIC of 10 nM or less. These results indicate that halofantrine would be a suitable alternative for the treatment of *P. falciparum* malaria in the region in the future, if and when the need arises, provided that its use was carefully monitored.

25 **Hombhanje FW, Kereu RK, Bulungol P, Paika R.**

Halofantrine in the treatment of uncomplicated falciparum malaria with a three-dose regimen in Papua New Guinea: a preliminary report.

PNG Med J 1998 Mar;41(1):23-29.

We evaluated the efficacy and safety of halofantrine in 19 patients with acute uncomplicated falciparum malaria. Each patient received oral halofantrine hydrochloride 500 mg every 6 hours for 3 doses (total 1.5 g). In almost all the patients clinical symptoms of malaria and parasitaemia disappeared within 2 and 3 days, respectively, of starting treatment. We observed no recurrence of parasitaemia during 14 days of follow-up. Tolerance to halofantrine was good except for minor and self-limiting gastrointestinal side-effects. Haematological and biochemical indices were not seriously affected. Halofantrine-induced prolongation of Q-T/Q-Tc intervals was the consistent cardiac manifestation in 84% of patients. The Q-T/Q-Tc interval prolongation increased with each dose; it reached a maximum between 18 and 24 hours and thereafter returned to baseline. These preliminary data indicate that, apart from the cardiac side-effects, halofantrine is an effective and safe drug, well tolerated by most of the patients in the study.

26 **Howard P, Alexander ND, Atkinson A, Clegg AO, Gerega G, Javati A, Kajoi M, Lupiwa S, Lupiwa T, Mens M, Saleu G, Sanders RC, West B, Alpers MP.**

Bacterial, viral and parasitic aetiology of paediatric diarrhoea in the highlands of Papua New Guinea.

J Trop Pediatr 2000 Feb;46(1):10-14.

Enteropathogens and clinical features associated with diarrhoea were investigated in

1526 children admitted over a 5-year period to the paediatric ward of a hospital in the highlands of Papua New Guinea. Overall, a recognized pathogen was isolated from 39 per cent of the children admitted with diarrhoea. The most commonly isolated agents were rotavirus (23 per cent), *Shigella* spp. (13 per cent), *Campylobacter* spp. (12 per cent), *Cryptosporidium parvum* (10 per cent) and enteropathogenic *Escherichia coli* (8 per cent). The clearest clinical associations were rotavirus with vomiting, and *Shigella* with blood and pus in the stool. A control series of children admitted with other complaints was also included, and the odds ratios for diarrhoea for the above five pathogens were 18.2, 9.6, 3.7, 2.2, and 1.6, respectively.

27 **Ishii A, Nagai N, Arai M, Kawabata M, Matsuo T, Bobogare A, Leafasia J.**

Chemotherapeutic malaria control as a selective primary health care activity in the Solomon Islands.

Parasitologia 1999 Sep;41(1-3):383-384.

Malaria control by chemotherapy has been established in rural villages of Guadalcanal, the Solomon Islands, following field trials. As a selective primary health care activity, mobile unit teams visited villages once or twice a year to detect malaria positives and gave chloroquine and primaquine to treat the infection and interrupt the transmission. On site diagnosis was by the use of acridine orange fluorescent staining or the ICTPf commercial diagnostic kit. To avoid possible haemolytic crises, a new single-step screening method of G6PD deficiency was introduced. This approach has been accepted well by villagers and proved to be an efficient and feasible control method even in remote rural villages with endemic malaria transmission. Epidemiological modelling of the situation predicts reduction of prevalence in five years.

28 **Jones IS.**

Back to basics midwifery in Arawa, Bougainville, during 1998.

Aust NZ J Obstet Gynaecol 1999 Aug;39(3):317-320.

Working in a country which is suffering the aftermath of war is a very professionally rewarding and, at the same time, humbling experience. It highlights so many things that we in Australia take for granted. The importance of a safe water supply and an efficient sewerage system is vital for the well-being of a community. Illnesses that were important in Australia 30 or more years ago, were commonplace on Bougainville in 1998 and 1999. I was also reminded of how much reliance we place on modern technology as we practise obstetrics in Australia in 1999. In Bougainville clinical skills and common sense were all that the midwives had and they used them to great effect. Tribute should be paid to the men and women of the PMG (Peace Monitoring Group) for without their dedication and professionalism the improvement in the health of the people in Bougainville during the last 18 months would not have been possible.

- 29 **Kaneko A, Lum JK, Yaviong L, Takahashi N, Ishizaki T, Bertilsson L, Kobayakawa T, Björkman A.** High and variable frequencies of CYP2C19 mutations: medical consequences of poor drug metabolism in Vanuatu and other Pacific islands. *Pharmacogenetics* 1999 Oct;9(5):581-590.
- Cytochrome P450 (CYP) 2C19 is polymorphic with poor metabolizers representing 3-6% of Europeans and Africans, and 13-23% of Asians. Greater than 99% of the poor metabolizer alleles in Asian populations are defined by two single-base-pair mutations (CYP2C19*2 and CYP2C19*3). We have recently reported an unprecedentedly high prevalence (71%) of CYP2C19-related poor metabolizer genotype individuals and poor metabolism of proguanil on two malarious islands of Vanuatu in eastern Melanesia. To elucidate this further, a total of 5538 individuals from 24 populations on 16 different islands of Vanuatu were genotyped. Of these, 61% had a poor metabolizer genotype (*2/*2, *2/*3 or *3/*3) with substantial variation among the populations (38-79%). The overall frequencies of CYP2C19*1 (wild-type), CYP2C19*2, and CYP2C19*3 were 0.223, 0.633, and 0.144, respectively. A significant linear correlation was observed between heterozygosity and South latitude ($r = 0.552$, $p < 0.05$). The genotype frequencies of 21 of the 24 populations were consistent with Hardy-Weinberg expectations ($p > 0.05$). Comparisons of genetic, linguistic and geographical patterns among populations suggest that short range gene flow is largely responsible for the current distribution of CYP2C19 alleles in Vanuatu. Taken together with previous studies of nuclear genetic loci of Pacific island populations, these data predict that the poor metabolizer genotype is common throughout Polynesia and Micronesia and may be even more prevalent in western Melanesia than in Vanuatu. This suggests that the majority of Pacific Islanders metabolize a wide variety of clinically important drugs to a significantly lower degree than the average European.
- 30 **Kariwiga G, Amoa AB, Mola G, Heywood S.** Familial ovarian cancer: report of ovarian carcinoma in three sisters. *PNG Med J* 1997 Sep-Dec;40(3-4):146-149.
- This is a report of ovarian carcinoma occurring in two sisters diagnosed almost at the same time, prompting prophylactic oophorectomy in a third sister. Histology of the overtly normal ovary in the third sister showed a focus of ovarian cancer. Discussion and a review of the literature suggest that any program designed to reduce the incidence of late-stage ovarian carcinoma should include the surveillance of family members of the index case, including the performance of prophylactic oophorectomy in the unaffected members of the family after they have completed their families.
- 31 **Kemiki AD, Baki M, Vince JD.** Kawasaki disease in a Papua New Guinean child: the first recorded case. *PNG Med J* 1997 Sep-Dec;40(3-4):168-172.
- 32 **Klufio CA, Amoa AB, Augerea L, Wurr F.** A case-control study of singleton low birthweight babies at the Port Moresby General Hospital. *PNG Med J* 1997 Sep-Dec;40(3-4):136-145.
- A retrospective study of 432 consecutive singleton low birthweight babies and 432 unmatched controls was carried out at the Port Moresby General Hospital from January to December 1988. Of the 432 low birthweight babies 65% were preterm, 27% were light for gestational age, 6% were both preterm and light for gestational age and 2.5% could not be classified. The results of the analysis showed low birthweight to be significantly associated with the past delivery of a low birthweight infant, very young and elderly mothers, lack of antenatal care, poor family planning, hypertensive disease in pregnancy and intrauterine death. This study reveals that maternal education and improved antenatal care and family planning would ultimately reduce the incidence of low birthweight babies and perinatal mortality in Papua New Guinea.
- 33 **Kumaratilake LM, Ferrante A.** Opsonization and phagocytosis of *Plasmodium falciparum* merozoites measured by flow cytometry. *Clin Diagn Lab Immunol* 2000 Jan;7(1):9-13.
- A flow cytometric phagocytosis assay was established to investigate the role of anti-merozoite antibody, complement, and cytokines on the phagocytosis of *Plasmodium falciparum* merozoites by human neutrophils. This assay involved allowing fluorescein isothiocyanate-labeled merozoites to interact with phagocytes and analysis of the cells on a FACScan with Lysis II software. To differentiate the proportion of neutrophil surface-bound merozoites from the merozoites ingested by neutrophils, the fluorescence of bound merozoites was quenched by adding trypan blue. The data showed that sera from malaria-immune individuals in the Solomon Islands and Papua New Guinea promoted merozoite engulfment by neutrophils. The cytokines tumor necrosis factor alpha, gamma interferon, granulocyte-macrophage colony-stimulating factor, and interleukin-1beta significantly increased the amount and the rate of merozoite phagocytosis by neutrophils. Optimum merozoite phagocytosis occurred when both cytokines and anti-malarial antibody were present.
- 34 **Kun JF, Klabunde J, Lell B, Luckner D, Alpers M, May J, Meyer C, Krensner PG.** Association of the ICAM-1Kilifi mutation with protection against severe malaria in Lambarene, Gabon. *Am J Trop Med Hyg* 1999 Nov;61(5):776-779.
- The intercellular adhesion molecule-1 (ICAM-1) is thought to be a receptor that mediates binding of *Plasmodium falciparum*-infected erythrocytes. Especially in vital organs, the binding of parasitized cells to the endothelium via ICAM-1 may lead to severe disease and death. Recently, a mutation in the coding region of ICAM-1, termed ICAM-1Kilifi, was described, causing a change

from Lys to Met in the loop that interacts with rhinoviruses, lymphocytes, and parasitized red blood cells. Surprisingly, this mutation was shown to increase susceptibility of Kenyan children to severe malaria in one study. When we compared the distribution of ICAM-1Kilifi in two groups of Gabonese children enrolled in a case-control, matched-pair study who presented with either mild or severe malaria, we found that 55% of the patients with mild malaria were carriers whereas only 39% of those with severe malaria were carriers. The difference in the distribution of ICAM-1Kilifi homozygous pairs between the groups, as well as the distribution of ICAM-1Kilifi carriers, was statistically highly significant ($p = 0.027$ and $p = 0.012$, by the McNemar test). In a group of healthy school children from the same region, a distribution of 52% ICAM-1Kilifi carriers to 48% wild-type individuals was found. In a survey for the ICAM-1Kilifi in other malaria-endemic regions, this allele was also found in Nigeria and Papua New Guinea, but not in Thailand.

35

Le Bras J.

[Mechanisms and dynamics of drug resistance in *Plasmodium falciparum*].

Bull Soc Pathol Exot 1999 Sep-Oct;92(4):236-241.

[Fr]

The emergence of chloroquine resistance has been associated with a dramatic increase in malaria mortality in some human populations from endemic regions. *Plasmodium falciparum* drug-resistant malaria originates from chromosomal mutations. Analysis using molecular, genetic and biochemical approaches has shown that 1) impaired intake of chloroquine by the parasite vacuole is a common characteristic of resistant strains, the chloroquine-resistance mechanism regulates the access of chloroquine to hemozoin, this phenotype correlates with Pfm1 and Pfcg2 gene mutations; 2) one to four point mutations of dihydrofolate reductase, the enzyme target of antifolates (pyrimethamine and proguanil), give moderate to high levels of resistance to these drugs but there is a fitness cost to resistance; 3) the mechanism of resistance to sulfonamides and sulfones involves mutations of dihydropteroate synthase, their enzyme target; 4) treatment with sulphadoxine-pyrimethamine (SP) selected for the variants Ile(51), Arg(59) and Asn(108) of DHFR and for the variants Ser(436), Gly(437), and Glu(540) of DHPS; 5) clones that were resistant to some traditional antimalarial agents acquired resistance to new ones at high frequency (accelerated resistance to multiple drugs - ARMD). Amino-alcohol (quinine, mefloquine, halofantrine) mechanisms of resistance are still unclear. Population genetic studies have confirmed that selfing is more frequent in *Plasmodium falciparum* where the transmission rate is lower in some regions such as Papua New Guinea, whereas isolates from individuals on the Thai-Burmese border, an area of hypoendemic transmission, revealed a higher number of genotypes per infected person. It has been suggested that intense intra-host

competition between co-infecting clones, low numbers of genes required to encode resistance, and high drug usage all encourage the emergence of drug resistance. On the other hand, the greater effective recombination in high transmission areas may breakdown multiple drug resistance when it is coded for by two unlinked loci. Epidemiological studies have established that the frequency of chloroquine-resistant mutants varies among parasite isolate populations while resistance to antifolates is highly prevalent in most malarial endemic countries (more than 92% of Kenyan field isolates have undergone at least one point mutation). Established and strong drug pressure as well as low antiparasitic immunity probably explains the multidrug resistance encountered in forests of Southeast Asia and South America. In Africa, frequent genetic recombinations in *Plasmodium* originate from a high level of malaria transmission, and falciparum chloroquine-resistant prevalence seems to stabilise at an equal level as chloroquine-sensitive malaria. Clinical studies demonstrated that control of clinical symptoms is better when chloroquine is used with sulphadoxine-pyrimethamine (SP) than when SP is used alone, and the cure rate also tends to be higher with the triple combination regimen.

36

Lehmann D, Yeka W, Rongap T, Javati A, Saleu G, Clegg A, Michael A, Lupiwa T, Omena M, Alpers MP.

Aetiology and clinical signs of bacterial meningitis in children admitted to Goroka Base Hospital, Papua New Guinea, 1989-1992.

Ann Trop Paediatr 1999 Mar;19(1):21-32.

Children aged 1-59 months admitted to Goroka Base Hospital with signs suggestive of meningitis were recruited to determine what proportion of such children have clinical or bacterial meningitis and to investigate the bacterial aetiology. A laboratory classification of definite, probable, possible, indeterminate and no meningitis was established. 30 per cent of 697 children had a final clinical diagnosis of meningitis, 12% had culture-proven bacterial meningitis (case fatality rate 34%) and 10% had probable or possible meningitis. Inability to feed, vomiting, drowsiness, 'staring eyes' and haemoglobin < 9 g/dl in addition to the classical signs of meningitis were associated with increased mortality. Isolates from cerebrospinal fluid were 62 pneumococci, 22 *Haemophilus influenzae* type b (Hib) and one *Neisseria meningitidis*. Including blood culture-proven and antigen-proven Hib disease, Hib and pneumococci accounted for 44% and 46% of bacterial meningitis, respectively, and 23% of pneumococci were intermediately resistant to penicillin. Inability to feed, bulging fontanelle, convulsions in young children, neck stiffness, fever and 'staring eyes' were all independently associated with bacterial meningitis. Conjugate Hib vaccine must be given to infants as early as possible. Conjugate pneumococcal vaccines, maternal immunization with 23-valent vaccine and pneumococcal protein vaccines are under investigation for prevention of pneumococcal disease.

- 37 **Lin M, Chu CC, Lee HL, Chang SL, Ohashi J, Tokunaga K, Akaza T, Juji T.**
Heterogeneity of Taiwan's indigenous population: possible relation to prehistoric Mongoloid dispersals.
Tissue Antigens 2000 Jan;55(1):1-9.
Taiwan's 9 indigenous tribes (Tsou, Bunun, Paiwan, Rukai, Atayal, Saisiat, Ami, Puyuma, Yami) are highly homogeneous within each tribe, but diversified among the different tribes due to long-term isolation, most probably since Taiwan became an island about 12,000 years ago. Homogeneity of each tribe is evidenced by many HLA-A,B,C alleles having the world's highest ever reported frequencies, e.g. A24 (86.3%), A26 (18.8%), Cw10 (36.8%), Cw7 (66%), Cw8 (32.1%), B13 (27.9%), B62 (37.4%), B75 (18%), B39 (53.5%), B60 (33.3%) and B48 (24%). Also, all of these tribes have HLA class I haplotype frequencies greater than 10%, with A24-Cw7-B39 in Saisiat (44.5%) being the highest, suggesting Taiwan's indigenous tribes are probably the most homogeneous (the 'purest') population in the world. A24-Cw8-B48, A24-Cw10-B60 and A24-Cw9-B61, found common to many Taiwan indigenous tribes, have also been observed in Maori, Papua New Guinea Highlanders, Orochons, Mongolians, Inuit, Japanese, Man, Buryat, Yakut, Tlingit, Tibetans and Thais. These findings suggest Taiwan's indigenous groups are more or less genetically related to both northern and southern Asians. Principal component analysis and the phylogenetic tree (using the neighbor-joining method) showed close relationship between the indigenous groups and Oceanians. This relationship supports the hypothesis that Taiwan was probably on the route of prehistoric Mongoloid dispersals that most likely took place along the coastal lowland of the Asian continent (which is under the sea today). Cultural anthropology also suggests a relationship between Taiwan's indigenous tribes and southern Asians and, to a lesser extent, northern Asians. However, the indigenous groups show little genetic relationship to current southern and northern Han Chinese.
- 38 **Mackenzie JS.**
Emerging viral diseases: some comments from a regional perspective.
PNG Med J 1998 Mar;41(1):1-6.
- 39 **McMaster P, Cadzow S, Vince J, Appleton B.**
Hyperekplexia: a rare differential of neonatal fits described in a developing country.
Ann Trop Paediatr 1999 Dec;19(4):345-348.
Hyperekplexia is a rare condition in which there is an exaggerated startle response. We report how a case presented in Papua New Guinea (PNG) and was diagnosed with international support. This is the first reported case in PNG. It is an important diagnosis to make to prevent sudden death and inappropriate treatment. The case illustrates the benefit of having a link with an international specialist and we discuss the importance of communication between developing and industrialized countries.
- 40 **McMaster P, Vince JD.**
Outcome of neonatal care in Port Moresby, Papua New Guinea: a 19-year review.
J Trop Pediatr 2000 Feb;46(1):57-61.
The effectiveness of changes in practice can only be determined by comparing outcome before and after their introduction. This report presents and discusses the neonatal statistics from Port Moresby General Hospital (PMGH) over the last 19 years and attempts to determine the effects of changes in practice introduced during the last year of the study period. Neonatal mortality rates have been very constant. However, the changes in practice - having all but the sickest babies nursed with their mothers and encouraging kangaroo care - together with strict adherence to breastfeeding policies, including the use of expressed breastmilk wherever possible, and the close involvement of the local breastfeeding support group in follow-up, appeared to have beneficial effects in reducing the length of stay and increasing the rate of weight gain in the very low birthweight babies.
- 41 **Mebs D.**
Notes on the traditional use of plants to treat snake bite in northern Papua New Guinea.
Toxicon 2000 Feb;38(2):299-302.
Information on snake bite treatment using plants was collected in three areas of northern Papua New Guinea. Liquid from six plants is either placed topically on the bite site or plant parts (bark) are chewed and the sap is swallowed. However, beside tannins in the bark no secondary metabolites, e.g. alkaloids, steroids, saponins or flavonoids, have been detected by thin-layer chromatography in alcoholic extracts of the plants involved, rendering this type of snake bite treatment questionable.
- 42 **Millane T, Vince J, Gale A, Nunn G, Lee R, Hawker R.**
Operation Open Heart 1995: lessons learned and thoughts for the future.
PNG Med J 1997 Sep-Dec;40(3-4):157-167.
- 43 **Pharoah PO.**
Duncan Memorial Lecture: Part 1. Dr Duncan's legacy in a remote New Guinea valley.
J Epidemiol Community Health 1999 Dec;53(12):794-800.
- 44 **Piper KP, Hayward RE, Cox MJ, Day KP.**
Malaria transmission and naturally acquired immunity to PfEMP-1.
Infect Immun 1999 Dec;67(12):6369-6374.
Why there are so few gametocytes (the transmission stage of malaria) in the blood of humans infected with *Plasmodium* spp. is intriguing. This may be due either to reproductive restraint by the parasite or to unidentified gametocyte-specific immune-mediated clearance mechanisms. We propose another mechanism, a cross-stage immunity to *Plasmodium falciparum* erythrocyte membrane protein 1 (PfEMP-1). This molecule is expressed on the surface of the erythrocyte infected with either trophozoite or

early gametocyte parasites. Immunoglobulin G antibodies to PfEMP-1, expressed on both life cycle stages, were measured in residents from an area where malaria is endemic, Papua New Guinea. Anti-PfEMP-1 prevalence increased with age, mirroring the decline in both the prevalence and the density of asexual and transmission stages in erythrocytes. These data led us to propose that immunity to PfEMP-1 may influence malaria transmission by regulation of the production of gametocytes. This regulation may be achieved in two ways: (i) by controlling asexual proliferation and density and (ii) by affecting gametocyte maturation.

45 **Pozio E, Owen IL, La Rosa G, Sacchi L, Rossi P, Corona S.**

Trichinella papuae n.sp. (Nematoda), a new non-encapsulated species from domestic and sylvatic swine of Papua New Guinea.

Int J Parasitol 1999 Nov;29(11):1825-1839.

Encapsulated and non-encapsulated species of the genus *Trichinella* are widespread in sylvatic animals in almost all zoogeographical regions. In sylvatic animals from Tasmania (Australian region), only the non-encapsulated species *Trichinella pseudospiralis* has been reported. Between 1988 and 1998, non-encapsulated larvae of *Trichinella* were detected in five domestic pigs and six wild boars from a remote area of Papua New Guinea. Morphological, biological and molecular studies carried out on one strain isolated from a wild boar in 1997 suggest that these parasites belong to a new species, which has been named *Trichinella papuae* n.sp. This species can be identified by the morphology of muscle larvae, which lack a nurse cell in host muscles, and whose total length is one-third greater than that of the other non-encapsulated species, *T. pseudospiralis*. Adults of *T. papuae* do not cross with adults of the other species and genotypes. Muscle larvae of *T. papuae* are unable to infect birds, whereas those of *T. pseudospiralis* do. The expansion segment V of the large subunit of the ribosomal DNA differs from that of the other species and genotypes. All of these features allow for the easy identification of *T. papuae*, even in poorly equipped laboratories. The discovery and identification of a second non-encapsulated species in the Australian region strongly supports the existence of two evolutionary lines in the genus *Trichinella*, which differ in terms of the capacity of larvae to induce a modification of the muscle cell into a nurse cell.

46 **Reeve PA, Stewart T, Talt BD.**

An epidemic of reactive arthritis in Vanuatu: a descriptive study.

Med J Aust 2000 Feb 7;172(3):143-144.

47 **Rohde K, Hayward CJ.**

Scomberomorocotyle munroi n. g., n. sp. (Scomberomorocotylineae n. subf.), a thoracocotylid monogenean from *Scomberomorous munroi* (Scombridae) off Australia and Papua New Guinea.

Syst Parasitol 1999 May;43(1):1-6.

Scomberomorocotyle munroi n. g., n. sp. is described from the gills of *Scomberomorous munroi*, a Spanish mackerel from the coasts of northern Australia and southern Papua New Guinea. The genus belongs to the suborder Gastrocotylinae because a pair of basal accessory sclerites is present in the clamps. However, the worm does not belong to any of the eight gastrocotylinae families as they are currently recognised. The worm appears to be a member of the Thoracocotyliidae, in that the male copulatory organ has relatively weakly developed spines, and that the haptor is one-sided with two rows of clamps. However, the worm differs from all thoracocotylids in that the clamps lack the characteristic lateral rib-like thickenings. To accommodate the new genus and species, the diagnosis of the Thoracocotyliidae Price is amended to include worms lacking ribs in their clamps, and a new subfamily, the Scomberomorocotylineae n. subfam., is erected; a key to the four subfamilies which we recognise as valid is provided.

48 **Spicer PE, Phillips D, Pike A, Johansen C, Melrose W, Hall RA.**

Antibodies to Japanese encephalitis virus in human sera collected from Irian Jaya. Follow-up of a previously reported case of Japanese encephalitis in that region.

Trans R Soc Trop Med Hyg 1999 Sep-Oct;93(5):511-514.

Japanese encephalitis virus (JEV) and other arboviruses are demonstrating an emergence in the southern part of New Guinea Island. JE was previously unknown in this part of the world until 1995 when it was found in the Torres Strait, northern Australia. In this study 96 sera collected from residents of the Timika region of Irian Jaya were tested for antibodies to JEV and related arboviruses by epitope-specific blocking ELISA. Of the 9 sera deemed to be positive for JEV antibodies by ELISA, 5 were collected from persons indigenous to Timika, and who had not travelled to regions where JE is known to be active. This indicates that these individuals were infected with JEV in the Timika area and supports a recent report of a clinical case of JE in this region. Non-immune expatriates visiting or working in the Lowland areas of Irian Jaya and/or Papua New Guinea should consider immunization against JE. Precautions should always be taken to avoid being bitten by any mosquito both in the daytime and at night.

49 **Stirnadel HA, Beck HP, Alpers MP, Smith TA.**

Genetic analysis of IgG subclass responses against RESA and MSP2 of *Plasmodium falciparum* in adults in Papua New Guinea.

Epidemiol Infect 2000 Feb;124(1):153-162.

Contributions of environmental and genetic factors to IgG subclass responses against *Plasmodium falciparum* antigens RESA and MSP2 were investigated among adults in a highly endemic area of Papua New Guinea. Heritabilities were estimated using variance component analysis.

Familial aggregation of several responses was found, including IgG1, IgG2 and IgG3 responses against RESA, IgG1 and IgG3 responses against the 3D7 form of MSP2 and IgG1, IgG2 responses against the FC27 form of MSP2. Allowance for sharing of HLA class II genotypes explained some of the non-genetic variance but not the familial aggregation. The variance of IgG3 responses against RESA and IgG1, IgG2 against MSP2 (FC27) was partly explained by sharing of HLA class II genotypes, although heritability was low. Segregation analyses indicated that any genetic regulation was more complex than governed by a single major gene. Such host genetic variation in responses to specific malaria antigens has implications for immunoparasitology and vaccine development.

50 **Turtle AM.**

Introduction to the special issue: the 1898 Cambridge anthropological expedition to the Torres Strait.

J Hist Behav Sci 1999 Fall;35(4):341-343.

51 **Vasuvattakul S, Yenchitsomanus PT, Vachuanichsanong P, Thuwajit P, Kaitwatcharachai C, Laosombat V, Malasit P, Wilairat P, Nimmannit S.**

Autosomal recessive distal renal tubular acidosis associated with Southeast Asian ovalocytosis.

Kidney Int 1999 Nov;56(5):1674-1682.

BACKGROUND: A defect in the anion exchanger 1 (AE1) of the basolateral membrane of type A intercalated cells in the renal collecting duct may result in a failure to maintain a cell-to-lumen H⁺ gradient, leading to distal renal tubular acidosis (dRTA). Thus, dRTA may occur in Southeast Asian ovalocytosis (SAO), a common AE1 gene abnormality observed in Southeast Asia and Melanesia. Our study investigated whether or not this renal acidification defect exists in individuals with SAO. **METHODS:** Short and three-day NH₄Cl loading tests were performed in 20 individuals with SAO and in two subjects, including their families, with both SAO and dRTA. Mutations of AE1 gene in individuals with SAO and members of the two families were also studied. **RESULTS:** Renal acidification in the 20 individuals with SAO and in the parents of the two families was normal. However, the two clinically affected individuals with SAO and dRTA had compound heterozygosity of 27 bp deletion in exon 11 and missense mutation G701D resulting from a CGG → CAG substitution in exon 17 of the AE1 gene. Red cells of the two subjects with dRTA and SAO and the family members with SAO showed an approximate 40% reduction in sulfate influx with normal 4,4'-di-isothiocyanato-stilbene-2,2'-disulfonic acid sensitivity and pH dependence. **CONCLUSION:** These findings suggest that compound heterozygosity of abnormal AE1 genes causes autosomal recessive dRTA in SAO.

52 **Verma N, Garap JA, Maris R, Kerek A.**

Intraoperative use of mitomycin C in the treatment of recurrent pterygium.

PNG Med J 1998 Mar;41(1):37-42.

The prevalence rate of pterygium in Papua New Guinea (PNG) is as high as 15%. Recurrence rates up to 50% are encountered after primary excision. In a country such as PNG where resources in terms of funds and manpower are limited, a simple procedure had to be identified to reduce this alarmingly high rate of pterygium recurrence. This article compares the results of a randomized masked study involving the single intraoperative application of 0.02% mitomycin C solution in 65 eyes undergoing surgery for recurrent pterygium using the bare sclera technique with a similar group of 65 patients in which the drug was not used. The results indicate that a single intraoperative application of mitomycin C solution was enough to reduce the recurrence rate of pterygium to 3% in the treated group as compared to 48% in the untreated group at the end of a 12-month follow-up. In the study it was also seen that, in PNG, pterygia were more common in females and that recurrences tended to occur early and were obvious in the first few weeks following surgery.

53 **Ward CP, Clotley GT, Dorris M, Ji DD, Arnot DE.**

Analysis of *Plasmodium falciparum* PfEMP-1/var genes suggests that recombination rearranges constrained sequences.

Mol Biochem Parasitol 1999 Jul 30;102(1):167-177.

The var genes of *Plasmodium falciparum* encode a family of parasite erythrocyte surface antigens, the PfEMP-1 proteins, which function as adhesion ligands for host endothelial and erythrocyte receptors. PfEMP-1 is extremely polymorphic although the extent of this variation in naturally transmitted parasite populations is unclear. We have identified 56 different sequences from the Duffy binding-like (DBL-1) domain of var genes amplified from six different *P. falciparum* clones isolated from patient infections in a Sudanese village in October-November 1989. These clones have been compared with 25 PfEMP-1 sequences expressed from different var gene loci by the 3D7A clone and 48 PfEMP-1 sequences from different isolates in endemic areas such as Kenya, Brazil, Gambia, Vietnam and Vanuatu to analyse diversity in clonal, local and 'global' *P. falciparum* populations. Evidence that certain conserved sequences recur in clones from one Sudanese village and in isolates from all over the world suggests that var gene diversity is the result of recombinational reshuffling of a subset of conserved, presumably ancestral sequences. Recurrence of particular var sequence blocks thus leads to 'overlaps' in the PfEMP-1 sequence repertoire of different *P. falciparum* clones.

54 **Wickham B.**

Sharing skills in the Pacific [interview by Anne Manchester].

Nurs NZ 1999 Apr;5(3):28.

55 **Wuethrich B.**

Anthropology. Proto-Polynesians quickly settled Pacific [news].

Science 1999 Dec 10;286(5447):2054-2056.

- 56 **Wyrsh M, Coakley K, Alexander N, Saleu G, Taime J, Kakazo M, Howard P, Lehmann D.**

Diarrhoea morbidity in children in the Asaro Valley, Eastern Highlands Province, Papua New Guinea.

PNG Med J 1998 Mar;41(1):7-14.

A morbidity study of diarrhoea covering 1926 children aged less than 5 years was carried out in Goroka town and the Lowa and Asaro Census Divisions, Eastern Highlands Province between 1986 and 1989. The study involved weekly demographic surveillance of the total population and morbidity surveillance of children by lay reporters who enquired about the presence or absence on any of the preceding 8 days of a range of symptoms associated with diarrhoeal and respiratory diseases. A three-day symptom-free period was used to define distinct episodes of diarrhoea. The average number of episodes/child-year for all children in the study population was 3.0. Boys suffered a significantly higher incidence of diarrhoea under 48 months of age than girls (4.4 episodes compared to 3.6/child-year). Incidence was highest among those aged 6-17 months (5.5/child-year) with a rapid decline after age 35 months. Incidence of diarrhoea was highest in the more remote Asaro Census Division and was higher in periurban areas than in Goroka town. Incidence also varied significantly between villages, some villages experiencing up to 10 times the incidence of diarrhoea found in Goroka town. The incidence of diarrhoea was significantly higher in January than at other times of year. Duration of diarrhoea varied with age, the longest duration being an average of 4.7 days in the 12-17 months age group. In order to reduce diarrhoea morbidity, it is necessary to improve access to water, encourage improved hygiene practices and breastfeeding and warn people about the risks of sleeping with pigs.

- 57 **Yohannes K, Dulhunty JM, Kourleoutov C, Manuopangai VT, Polyn MK, Parks WJ, Williams GM, Bryan JH.**

Malaria control in central Malaita, Solomon Islands. 1. The use of insecticide-impregnated bed nets.

Acta Trop 2000 Mar 25;75(2):173-183.

The present study investigated the use of insecticide-impregnated bed nets by communities in central Malaita, Solomon Islands. Qualitative and quantitative data were collected by: (1) questionnaire administration to 124 care-givers of children aged 0-10 years of age; (2) 20 focus group discussions; (3) two structured observations of bed net re-impregnation; and (4) interviews with key informants. 94% of all care-givers had bed nets, but only 62% had sufficient bed nets for all household members. 52% used bed nets throughout the year and 70% of care-givers reported that all their children slept under bed nets. Although coastal householders considered malaria and mosquitoes more of a problem than inland householders, overall bed net compliance did not differ. Factors affecting bed net ownership were cost and community expectation of free bed nets. Bed net use was affected by four factors: (1)

seasonality (99% used bed nets during the rainy season, 52% used them all year); (2) mosquito nuisance (59% of respondents reported that protection against mosquitoes was the main reason for using a bed net); (3) weather (68% of care-givers would not use a bed net if the weather was hot); and (4) low density of mosquitoes (respondents who used bed nets as protection against mosquito nuisance were more likely not to use bed nets when mosquitoes were few than those who used bed nets for malaria protection (odds ratio (OR), 3.9; 95% confidence interval (CI), 1.4-12.0)). Protection against malaria was the main reason children slept under bed nets. Children from households where bed nets were used for malaria protection were more likely to sleep under bed nets than children from households where nets were used as protection from mosquitoes only (OR, 2.7; 95% CI, 1.3-5.9). Other factors that affected children's bed net use were, age (users were significantly younger than non-users; $\chi^2=7.9$, degrees of freedom=1, $p=0.005$) and sufficiency of bed nets (OR, 2.0; 95% CI, 1.3-7.0).

- 58 **Zimdahl H, Schiefenhövel W, Kayser M, Roewer L, Nagy M.**

Towards understanding the origin and dispersal of Austronesians in the Solomon Sea: HLA class II polymorphism in eight distinct populations of Asia-Oceania.

Eur J Immunogenet 1999 Dec;26(6):405-416.

HLA class II nucleotide sequence polymorphisms were examined in eight ethnic groups of Asia-Oceania using DNA typing methods. Allele frequencies and characteristic DR/DQ haplotypes were determined and compared with those of other populations of Asia-Oceania. Genetic distances were measured to show the genetic relationship within the studied populations as well as between the studied populations and previously published populations. Phylogenetic trees were constructed based on HLA allele frequencies using the neighbour-joining method. The populations, mainly Trobriand Islanders, Roro, Tolai, Western Samoans and Taiwanese Aborigines, are characterized by a reduced diversity at the HLA loci examined, especially for DPB1. The high frequency of the 'Asian'-specific DPB1*0501 allele in Trobrianders and Roro, but also in Western Samoans and Taiwanese Aborigines, was the most striking result. The prevalence of DPB1*0501 and the short genetic distance from Trobriander and Roro to Taiwanese Aborigines provide evidence that the origin of the Austronesian odyssey is south-east Asia, and Taiwan could be an important part of it. The relatedness of Trobrianders to the Polynesian population from Western Samoa indicates a probable recent common ancestor. The observed lack of diversity may reflect bottleneck(s) and/or limited diversity of the founding population. Analysis of HLA class I antigens, together with mt-DNA and Y-chromosomal studies, will give us further information about the settlement of the Trobriand and other islands during the colonization of the Pacific.

- 59 **Zimmerman PA, Woolley I, Masinde GL, Miller SM, McNamara DT, Hazlett F, Mgone CS, Alpers MP, Genton B, Boatman BA, Kazura JW.** Emergence of FY*A(null) in a *Plasmodium vivax*-endemic region of Papua New Guinea. *Proc Natl Acad Sci USA* 1999 Nov 23;96(24):13973-13977.

In Papua New Guinea (PNG), numerous blood group polymorphisms and hemoglobinopathies characterize the human population. Human genetic polymorphisms of this nature are common in malarious regions, and all four human malaria parasites are holoendemic below 1500 meters in PNG. At this elevation, a prominent condition characterizing Melanesians is alpha(+)-thalassemia. Interestingly, recent epidemiological surveys have demonstrated that alpha(+)-thalassemia is associated with increased susceptibility to uncomplicated malaria among young children. It is further proposed that alpha(+)-thalassemia may facilitate so-called 'benign' *Plasmodium vivax* infection to act later in life as a 'natural vaccine' against severe *Plasmodium falciparum* malaria. Here, in a *P.*

vivax-endemic region of PNG where the resident Abelam-speaking population is characterized by a frequency of alpha(+)-thalassemia ≥ 0.98 , we have discovered the mutation responsible for erythrocyte Duffy antigen-negativity (Fy[a-b-]) on the FY*A allele. In this study population there were 23 heterozygous and no homozygous individuals bearing this new allele (allele frequency, $23/1062 = 0.022$). Flow cytometric analysis illustrated a 2-fold difference in erythroid-specific Fy-antigen expression between heterozygous (FY*A/FY*A(null)) and homozygous (FY*A/FY*A) individuals, suggesting a gene-dosage effect. In further comparisons, we observed a higher prevalence of *P. vivax* infection in FY*A/FY*A ($83/508 = 0.163$) compared with FY*A/FY*A(null) ($2/23 = 0.087$) individuals (odds ratio = 2.05, 95% confidence interval = 0.47-8.91). Emergence of FY*A(null) in this population suggests that *P. vivax* is involved in selection of this erythroid polymorphism. This mutation would ultimately compromise alpha(+)-thalassemia/*P. vivax*-mediated protection against severe *P. falciparum* malaria.

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- 3 **Garner PA, Hill G.** Brainwashing in tuberculosis management. *PNG Med J* 1985;28:291-293.

- 4 **Cochrane RG.** A critical appraisal of the present position of leprosy. In: Lincicome DP, ed. *International Review of Tropical Medicine*. New York: Academic Press, 1961:1-42.

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