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Lumière

sur les publications scientifiques



**CENTRE SUISSE DE RECHERCHES
SCIENTIFIQUES EN CÔTE D'IVOIRE**

La Recherche en Partenariat pour le Développement Durable.



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Introduction



L'état de la recherche scientifique en Afrique est de façon générale en nette progression avec des perspectives de plus en plus prometteuses. Plusieurs pays comme le Rwanda, l'Ethiopie et le Ghana ont vu leur production scientifique s'accroître considérablement par une augmentation des activités en recherche et développement et des publications en quantité importante dans les revues de renoms. Toutefois, en Afrique de l'Ouest le nombre de publications scientifiques n'a pas progressé rapidement comme le reste du continent.

La Côte d'Ivoire, malgré ce constat sous régional peu reluisant et en dépit des pressions économiques récurrentes et des troubles socio-politiques se démarque avec une augmentation régulière de son niveau de productivité scientifique par rapport au taux régional et mondial. Entre 2000 et 2016, le nombre de publications de ce pays est passé de 4,1 à 8,5 par millions d'habitants dépassant le taux de productivité régional et mondial au cours de cette période de 17 ans.

Le Centre Suisse de Recherches Scientifiques en Côte d'Ivoire, centre de recherche d'excellence sous régional est l'un des principaux acteurs de ce rayonnement scientifique ivoirien. Ce centre d'excellence, nonobstant sa taille relativement petite, est le deuxième institut de recherche le plus productif de la Côte d'Ivoire. Selon une récente étude , le Centre Suisse de Recherches Scientifiques produit 170 publications annuellement. C'est donc une masse critique de publications et d'opportunités à la fois pour le

positionnement durable de ce centre et pour ces chercheurs à faire valoir.

Ces publications scientifiques sont en réalité des évidences pour l'orientation des actions de développement en faveur des communautés et des réponses aux défis multiples, complexes et urgents du moment. C'est dans ce cadre que ce document de valorisation se veut être un outil stratégique pour la visibilité des résultats de recherche. Comme avantage qualitatif dans cet environnement international de plus en plus concurrentiel et sélectif, le document de valorisation des publications permettra d'accroître les opportunités de partenariat, de collaboration et la capacité de mobilisation de ressources en montrant les compétences et expertises développées par le Centre Suisse de Recherches Scientifiques.

Avec une fréquence semestrielle de diffusion, ce document de valorisation des publications identifie l'ensemble des productions scientifiques publiées par les chercheurs du Centre Suisse de Recherches Scientifiques sur une période de six mois. Puis, ces publications sont présentées sous une classification par Domaines Activités Principales (DAP) de recherche de l'institut. La ligne finale va consister à mettre en lien les publications scientifiques du Centre Suisse de Recherches Scientifiques et les Objectifs de Développement Durables (ODD) pour mettre en lumière la contribution de centre de recherche d'excellence sous régional africain à l'atteinte du développement durable.

La Recherche au CSRS



La recherche au CSRS est caractérisée par des programmes pluriannuels, sur des thématiques porteuses de changement et susceptibles de susciter l'intérêt et les financements, selon des axes de recherches ayant fait l'objet d'une discussion stratégique approfondie, objective et résolument critique.

Le CSRS maintient le choix de la diversité et la transversalité de ses thèmes de recherche. Les thématiques de recherches s'inscrivent dans huit DAP transversaux. Quatre groupes de recherche dérivés des huit précédents travailleront à couvrir ces DAP (tableau 1). Les quatre groupes se présentent comme suit :

- Conservation et Valorisation des Ressources Naturelles (CVRN)
- Sécurité Alimentaire et Nutrition (SAN)
- Environnement et Santé (ESA)
- Gouvernance, Société et Développement Economique (GSDE)

L'organisation des groupes de recherche vise à plus d'efficacité et de synergies entre les groupes de recherche. Chacun des quatre groupes de recherche assure la coordination de deux DAP en veillant à développer des synergies avec les autres groupes de recherche. Chaque DAP est décliné en axes de recherche pour lui donner une orientation opérationnelle.

Ainsi, les thématiques de recherche sont identifiées au sein des axes de recherche sur la base de la curiosité scientifique d'une part, et de l'ambition de contribuer à l'atteinte des indicateurs des ODD d'autre part. Par ailleurs, le choix des thématiques de recherche est influencé par les besoins locaux, l'actualité nationale et internationale sans pour autant renoncer à l'indépendance de la recherche et au choix structurel du CSRS. Ces thématiques de recherche sont identifiées et mises en œuvre dans un cheminement Recherche-Innovation-Validation-Application.

Les projets au CSRS sont organisés en portefeuilles. Un portefeuille est un ensemble de projets interdépendants partageant des ressources communes. Ces ressources peuvent être humaines, techniques et financières, mais aussi des connaissances et des technologies. Les projets de recherche du CSRS seront structurés autour de cinq portefeuilles :

- Gestion de la biodiversité et des services écosystémiques ;
- Sécurité alimentaire et nutritionnelle ;
- Systèmes de santé et gestion l'environnement ;
- Adaptations aux changements climatiques ;
- Environnement politique et systèmes sociaux.

Domaines d'Activités Principales (DAP)

La contribution du CSRS à l'atteinte des Objectifs de Développement Durable (ODD) se fait par le biais de 8 priorités thématiques appelées Domaines d'Activités Principales (DAP) :



Biodiversité animale, Ethologie et Services écosystémiques



Biodiversité végétale et Bioproductions



Durabilité des systèmes de production agricole et Sécurité alimentaire



Mode de vie, et transition nutritionnelle



Risques environnementaux et sanitaires



Santé humaine et santé animale



Systèmes sociaux



Economie de l'Environnement et du Développement Local





80 and over | **Abidjan** | abrasive particles | **activity period.** | Adolescent | **Adult** | Aged | **albendazole** | **Anemia** | Animals | **Anopheles melas** | Anthelmintics | **Anti-Inflammatory Agents** | behavioral reaction | **Biomphalaria pfeifferi** | blood pressure | **Bulinus forskalii** | Bulinus globosus | **Bulinus truncatus** | Bulinus/*parasitology | **camera traps** | chemistry | **Child** | children | **classification** | clearance | **Coinfection** | Combination | **Compliance** | complications | **Connaissances** | conservation | **Côte d'Ivoire** | Cross-Sectional **Studies** | curiosity | **Demography** | distribution | **dose optimization** | Double-Blind Method | **dried-blood spot** | drug effects | **Drug efficacy** | Drug safety | **Drug Therapy** | elephant | **epidemiology** | exploration | **exposure** | Extracts | **fecal particle size** | Female | **Fruit** | Gene flow | **genetics** | Ghana | **Gorilla gorilla** | HEK293 Cells | **Hookworm Infections** | Hotspots | **Human rabies** | Humans | **hypertension** | **Indoor residual spraying** | infectious disease | **insecticide resistance** | Insecticides | **isolation & purification** | ivermectin | **Ivory Coast** | knockdown resistance | **Knowledge** | Lao PDR | **Lauraceae** | Logistic Models | **Long lasting insecticidal bednet** | looking impulse | **Lymphatic filariasis** | Magnetic Resonance Spectroscopy | **malaria** | Male | **Mass drug administration** | mastication | **metabolism** | Methylene Chloride | **Microfilariae** | Middle Aged | **Mitra** | Molecular markers | **Molecular Typing** | NAD(P)H Dehydrogenase (Quinone) | **neophobia** | Neuropeptide | **NF-kappa B** | novel object | **Observance** | Pan paniscus | **Pan troglodytes** | Parasitic prevalence | **parasitology** | pathology | **pharmacokinetics** | pharmacology | **Phylogeography** | Plant | **Plasmodiumspp** | Population Groups | **population pharmacokinetics** | post-mass drug administration surveillance | **Pregnancy** | Preschool | **purification** | Pyrones | **Rage humaine** | Réserve Naturelle Volontaire | **Risk** | Schistosoma bovis | **Schistosoma haematobium** | Schistosome hybrids | **Schistosomiasis** | Schistosomiasis haematobia | **Seasons** | Soil-transmitted helminthiasis | **Spatio-temporal structure** | Splenomegaly | **Stress response** | Sud-Ouest | **Systematic noncompliance** | Tai | **Taï National Park** | Tanzania | **temperament** | texture | **therapeutic use** | transmission | **Trichuriasis** | Trichuris | **Trichuris trichiura** | Vector control | **Wuchereria bancrofti** | xenomonitored | **Young Adult** |

Le **CSRS** œuvre, à travers la Recherche Scientifique et avec ses partenaires, à faire du Développement Durable une réalité pour Tous et ce, par le biais de 8 priorités thématiques baptisés **Domaines d'Activités Principales (DAP)**.

DAP 1

Biodiversité animale, Ethologie et Service écosystémique

La sous-région ouest africaine jouit d'une diversité faunique exceptionnelle qui participe à la fourniture des nombreux services écosystémiques. Les recherches et actions en faveur de la préservation de cette diversité faunique nous permettent de comprendre l'origine et l'évolution des comportements humaines à travers l'éthologie cognitive et l'écologie comportementale, mais aussi d'assurer le maintien de ces services rendus par la variété d'écosystèmes. Dans une approche transdisciplinaire, nous envisageons suivre la dynamique des espèces animales, appréhender des comportements clés affichés par plusieurs taxa et surtout contribuer à l'évaluation et au maintien des services écosystémiques qui profitent directement à nos populations mais également l'économie de nos pays.

7 Articles scientifiques dans 6 journaux avec 8 contributeurs du CSRS.



Le CSRS travail activement à l'atteinte des Objectifs de Développement Durable (ODD) par le biais de 8 priorités thématiques appelées Domaines d'Activités Principales (DAP).



Photo : Cercocèbe enfumé dans le Parc National de Taï | Crédits photo : F. Möllers

THE ONTOGENY OF INTENTIONAL COMMUNICATION IN CHIMPANZEES IN THE WILD

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Abstract

The onset of intentional communication in children's first year of life represents a major milestone in human cognitive development. Similarly, it is well established that our closest living relatives, the great apes, communicate with signals characterized by at least first-order intentionality. Despite the well-documented influence of developmental experiences on socio-cognitive abilities in apes, the developmental trajectory of intentional signal use as well as effects of social exposure remain poorly understood under naturalistic conditions. Here, we addressed these issues by studying the ontogeny of intentional communication in chimpanzee infants of two subspecies (*Pan troglodytes schweinfurthii/verus*) and communities living in their natural environments. Overall, we found that gestures and bimodal signal combinations were most commonly accompanied by markers of intentional communication: audience checking, persistence to the goal, and sensitivity to recipient's attentional state. Within individuals, the proportion of communicative behaviours associated with goal persistence and sensitivity to attention increased with age. Cross-sectional comparisons between infants revealed an age effect on the use of audience checking. Context, interaction partner and site affiliation affected the production of specific markers irrespective of infants' age. The present study provided hitherto undocumented evidence for the development of three important markers of intentional communication in great apes. Moreover, our results suggest that social exposure impacts early intentional signal use.

Télécharger

NOVELTY RESPONSE OF WILD AFRICAN APES TO CAMERA TRAPS

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Abstract

Temperament and personality research in humans and nonhuman animals measures behavioral variation in individual, population, or species-specific traits with implications for survival and fitness, such as social status, foraging, and mating success. Curiosity and risk-taking tendencies have been studied extensively across taxa by measuring boldness and exploration responses to experimental novelty exposure. Here, we conduct a natural field experiment using wildlife monitoring technology to test variation in the reaction of wild great apes (43 groups of naive chimpanzees, bonobos, and western gorillas across 14 field sites in Africa) to a novel object, the camera trap. Bonobo and gorilla groups demonstrated a stronger looking impulse toward the camera trap device compared to chimpanzees, suggesting higher visual attention and curiosity. Bonobos were also more likely to show alarm and other fearful behaviors, although such neophobic (and conversely, neophilic) responses were generally rare. Among all three species, individuals looked at cameras longer when they were young, were associating with fewer individuals, and did not live near a long-term research site. Overall, these findings partially validate results from great ape novelty paradigms in captivity. We further suggest that species-typical leadership styles and social and environmental effects, including familiarity with humans, best explain novelty responses of wild great apes. In sum, this study illustrates the feasibility of large-scale field experiments and the importance of both intrinsic and extrinsic factors in shaping animal curiosity.

Key words : Gorilla gorilla, Pan paniscus, Pan troglodytes, behavioral reaction, curiosity, exploration, looking impulse, neophobia, novel object, temperament

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SPATIAL DISTRIBUTION AND PERIOD OF ACTIVITY OF THE FOREST ELEPHANT (*LOXODONTA AFRICANA CYCLOTIS*) AT TAÏ NATIONAL PARK, SOUTH WESTERN CÔTE D'IVOIRE.

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Journal : Journal of Applied Biosciences

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Abstract

Objective: This study aims at determining the spatial distribution and period of activities of the forest elephant (*Loxodonta africana cyclotis*) at Taï National Park (TNP) to contribute to its conservation.

Methodology and results: Observations of elephants at different locations and time periods were recorded by using 87 camera traps with date and time-stamped settings. Cameras were installed following a systematic placement approach, and their geographic coordinates were recorded using a GPS. After 120 days of trapping, we observed a high concentration of activities in the southern areas of the park. For the period of activities, we noted that observations of unit individuals were recurrent during the day while those of elephant groups were more important at night.

Conclusion and application of the results: The south of the park where there is a large distribution of elephants would be more favourable to these animals. The small number and remoteness of large cities on the periphery of this area of the park could explain that pattern. The distribution and activity period information is useful for park surveillance by rangers. In addition, further studies are needed for a better explanation on the distribution pattern of elephants at TNP.

Key words : Taï National Park, elephant, camera traps, distribution, activity period.

Télécharger

VALEUR DE CONSERVATION DE LA RÉSERVE NATURELLE VOLONTAIRE (RNV) DE LA DODO, SUD-OUEST DE LA CÔTE D'IVOIRE (AFRIQUE DE L'OUEST)

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Journal : Current Biology
Année : 2019
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Abstract

En Côte d'Ivoire, le patrimoine forestier en milieu rural est confronté à une reconversion considérable en espace agricole. Cette situation conduit à la dégradation des habitats et à une perte croissante de la biodiversité. Pour inverser la tendance l'Etat sensibilise à la création de Réserves Naturelles Volontaires. Cependant, cette stratégie ne pourrait avoir l'assentiment de tous si les bienfaits de la diversité biologique en milieu rural ne sont pas développés et connus de tous. La présente étude se propose d'évaluer la valeur de conservation de la Réserve Naturelle Volontaire (RNV) de la Dodo. Pour y arriver, la méthodologie employée a porté sur l'inventaire de surface combiné à l'inventaire itinérant. Les différents types de végétation rencontrés sont les jachères, les savanes incluses, les forêts denses, les forêts secondaires et les forêts galeries. Il a été inventorié 242 espèces reparties 193 genres appartenant à 70 familles. Les familles les plus diversifiées par ordre d'importance sont les Euphorbiaceae, les Rubiaceae, les Caesalpiniaceae, les Annonaceae, les Apocynaceae. Les espèces de la région Guinéo-Congolaise (GC) sont les plus nombreuses. On dénombre vingt et une (21) espèces endémiques et 14 espèces rares et/ou menacées d'extinction. L'abondance des espèces à statut particulier et la présence d'habitats particuliers confèrent à la RNV les valeurs HVC1 et HVC3.

Mots clés : Réserve Naturelle Volontaire, conservation, Sud-Ouest, Côte d'Ivoire.

Télécharger

HUMAN IMPACT ERODES CHIMPANZEE BEHAVIORAL DIVERSITY

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Abstract

Chimpanzees possess a large number of behavioral and cultural traits among non-human species. The ‘disturbance hypothesis’ predicts that human impact depletes resources and disrupts social learning processes necessary for behavioral and cultural transmission. We used an unprecedented data set of 144 chimpanzee communities, with information on 31 behaviors, to show that chimpanzees inhabiting areas with high human impact have a mean probability of occurrence reduced by 88%, across all behaviors, compared to low impact areas. This behavioral diversity loss was evident irrespective of the grouping or categorization of behaviors. Therefore, human impact may not only be associated with the loss of populations and genetic diversity, but also affects how animals behave. Our results support the view that ‘culturally significant units’ should be integrated into wildlife conservation.

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Journal : Science

Année : 2019

Volume 363

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Pages : 1453-1455

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CORTISOL AND OXYTOCIN SHOW INDEPENDENT ACTIVITY DURING CHIMPANZEE INTERGROUP CONFLICT

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Journal : Psychoneuroendocrinology
Année : 2019
Volume 104
N° 1
Pages : 165-173

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Abstract

The oxytocinergic system is involved in a range of functions, from attachment and social bonding to aggression and stress responses. Whether oxytocin is released in response to a stressor, shows contradictory results across species and potential contexts-dependent differences. To avoid unintended contextual changes due to experimental procedures, we tested this question non-invasively in wild chimpanzees in an ecologically valid context. We collected endogenous hormonal measures during exposure to a known natural stressor, intergroup conflict. Specifically, we tested for potential synchronous activation patterns between urinary oxytocin and cortisol in male and female chimpanzees during stressor exposure. Oxytocinergic system reactivity during chimpanzee intergroup conflict has already been established in this study population. Thus, we first investigated urinary cortisol levels during border patrol and intergroup encounter days, in comparison to another potential stressor, hunting, and control days. We found higher urinary cortisol levels during intergroup encounter days compared with control and hunting days. We then compared secretion patterns of oxytocin and cortisol in relation to increased levels of out-group contact and hostility ('out-group risk') during intergroup conflict. We found that increased 'out-group risk' was associated with higher cortisol levels, especially when involving direct visual or physical contact with rival groups. Although urinary oxytocin levels were high across intergroup conflict contexts, increasing levels of out-group risk showed no significant variation. Taken together, results indicate independent secretion of oxytocin and cortisol during chimpanzee intergroup conflict, emphasizing that stressor exposure in this context is not the main trigger of oxytocin secretion.

Key words : Neuropeptide, Pan troglodytes, Risk, Stress response

DUST AFFECTS CHEWING EFFICIENCY AND TOOTH WEAR IN FOREST DWELLING WESTERN CHIMPANZEES (*PAN TROGLODYTES VERUS*).

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Journal : American Journal of Physical Anthropology
Année : 2019
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Pages : 66-77

Abstract

In humans it has been shown that abrasive particles in the diet result in increased tooth wear and less intense chewing behavior, both of which decrease chewing efficiency. This behavioral response may also exist in non-human primates as a means to reduce the wear effect of dust-laden food. Here we tested whether the periodical occurrence of abrasive dust particles in the diet of Western chimpanzees affects tooth wear and reduces chewing efficiency. MATERIALS AND METHODS: We measured fecal particle size of undigested food matter as an indicator of chewing efficiency in 13 Western chimpanzees of the Tai National Park (Ivory Coast) before (wet), after (wet) and during a dust-rich (dry) period. Moreover, feeding data were compiled for a further 12 chimpanzees and matched to three-dimensional surface texture data measured on two molar facets of 26 skulls of the same population. RESULTS: Fecal particles were larger during the dry period, indicating a reduced chewing efficiency compared to wet periods; age and sex did not have an effect. Concomitantly, dust led to an increase of abrasive wear evidenced by smaller texture features and higher density of fine furrows on wear facets. DISCUSSION: Our findings show that a periodical increase in dust loads on foods places a dietary-physiological stress on the digestive system in chimpanzees. We suggest that the impact of extrinsic abrasive particles from globally acting periodical dust-laden winds may affect evolutionary fitness. Further studies are required to elucidate this relationship in other non-human primates and fossil hominins.

Mots clés : Tai, abrasive particles, fecal particle size, mastication, texture

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DAP 2

Biodiversité végétale et Bioproductions

Les biomolécules des plantes offrent une grande diversité de services à l'Homme. Aujourd'hui, les bioproductions constituent des solutions alternatives d'avenir avec l'avantage de préserver la biodiversité végétale et de permettre l'utilisation des espèces rares ou protégées pour produire des actifs végétaux à grande valeur. Les recherches et actions dans ce domaine visent à organiser une filière verte de bioproduction d'extraits végétaux naturels, favoriser l'accès aux substances actives

pour l'innovation pharmaceutique, cosmétique, agro-alimentaire, agronomique, énergétique, à développer des bioproduits et à protéger la biodiversité. Dans l'optique de la création d'une économie verte forte pour nos communautés et les industries et ainsi contribuer significativement à la lutte contre la pauvreté, plusieurs études floristiques, ethnopharmacologies, «Social business model», phytochimie et procédés des biotechnologies vertes sont initiées dans une approche transdisciplinaire.

1 Article scientifique dans
1 journal avec
3 contributeurs du CSRS.



Le CSRS travail activement à l'atteinte des Objectifs de Développement Durable (ODD) par le biais de 8 priorités thématiques appelées Domaines d'Activités Principales (DAP).



Photo : Fruits séchés de Coelocaryon oxycarpum en vente au marché, une plante utilisée pour la confection d'un repas thérapeutique servi aux femmes post-partum dans le Département de Bondoukou, Côte d'Ivoire. | **Credits photo :** Doudjou Ouattara

ANTI-INFLAMMATORY AND QUINONE REDUCTASE-INDUCING COMPOUNDS FROM BEILSCHMIEDIA MANNII

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Journal : Planta Medica

Année : 2019

Volume 85

N° 5

Pages : 379-384

Abstract

Previous studies on the therapeutic potential of plant species found in the diet of chimpanzees living in Tai National Park have shown that they could be potential candidates for the search of new molecules useful for humans. Based on the screening of some of these plants, the fruits of *Beilschmiedia mannii*, whose dichloromethane extract showed cancer chemopreventive properties, were selected. Bioactivity-guided fractionation of the extract resulted in the isolation and identification of two gamma-pyrone, including desmethoxydihydromethysticin, found in a natural source for the first time, and a new congener, beilschmiediapyrone, as well as five known alkamides. Their structures were established by using nuclear magnetic resonance spectroscopy and mass spectrometry methods. The isolated compounds were evaluated for their cancer chemopreventive potential by using quinone reductase induction and nuclear factor-kappa B inhibition tests in Hepa 1c1c7 and HEK-293/NF-kappaB-Luc cells, respectively. Among them, compounds 1: and 2: were the most active. The concentrations to double the quinone reductase activity were 7.5 microM for compound 1: and 6.1 microM for compound 2: . Compounds 1: and 2: inhibited nuclear factor-kappa B with IC50 values of 2.1 and 3.4 microM, respectively. These results are promising with regard to cancer chemoprevention, especially because this plant is also used for cooking by the local population around the Tai forest.

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DAP 5

Risques environnementaux et sanitaires

L'évaluation de la complexité de l'interface 'Homme, Environnement, Santé' dans un contexte d'urbanisation accélérée, de pression démographique et des variabilités climatiques nécessite des approches innovantes impliquant des méthodes inter- et transdisciplinaires. Nous voulons apporter ici des réponses durables et adaptées à cette thématique, conformément aux Objectifs

du Développement Durable pour 2030. Une telle investigation associe entre autres des approches qualitatives, la microbiologie, la physico-chimie et la modélisation des systèmes. Les résultats attendus portent sur la réduction des vulnérabilités des populations aux chocs liés aux changements globaux et l'apport d'informations scientifiques viables sur les facteurs de risques aux décideurs.

10 Articles scientifiques dans 9 journaux avec 20 contributeurs du CSRS.



Le CSRS travail activement à l'atteinte des Objectifs de Développement Durable (ODD) par le biais de 8 priorités thématiques appelées Domaines d'Activités Principales (DAP).



Photo : Contexte épidémiogène favorable à la transmission de maladies tropicales | Crédits photo : Kigbafori D. Silué

EPIDEMIOLOGICAL LINKS BETWEEN MALARIA PARASITAEMIA AND HYPERTENSION: FINDINGS FROM A POPULATION-BASED SURVEY IN RURAL COTE D'IVOIRE. J HYPERTENS

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Journal : Journal of Hypertension
Année : 2019
Volume 37
N° 7
Pages : 1384-1392

Abstract

BACKGROUND: Although potential links between malaria parasitaemia and hypertension have been hypothesized, there is paucity of epidemiologic evidence on this link. We investigated in a population-based survey, the association between malaria parasitaemia and hypertension in Ivorian adults. **METHODS:** We estimated the adjusted odds ratios (OR) and 95% confidence intervals (CI) of hypertension in relation to malaria parasitaemia using multinomial regression, in 997 randomly selected adults in the 'Côte d'Ivoire Dual Burden of Disease Study' (CoDuBu), in south-central Côte d'Ivoire. We defined malaria parasitaemia as a positive rapid diagnostic test or identification of *Plasmodium* spp. on microscopy. Using the mean of the last two of three blood pressure (BP) measurements and questionnaire data, we defined hypertension as SBP at least 140 mmHg or DBP at least 90 mmHg or clinician-diagnosed hypertension. **RESULTS:** Prevalence of malaria parasitaemia and hypertension were 10 and 22%, respectively. Malaria parasitaemia was negatively associated with hypertension in participants with body temperature 36.5 degrees C or less [OR 0.23 (95% CI 0.06-0.84)]. Contrastingly, microscopic malaria parasitaemia showed positive associations with hypertension in participants with elevated body temperature [>36.5 degrees C; OR: 2.93 (95% CI 0.94-9.14)]. Participants having microscopic malaria parasitaemia with elevated body temperature had three-fold higher odds of hypertension [OR: 3.37 (95% CI 1.12-10.0)] than malaria parasitaemia-negatives with lower body temperature. **CONCLUSION:** Malaria parasitaemia and hypertension are prevalent and seemingly linked comorbidities in African settings. This link may depend on malaria parasitaemia symptomatology/latency where individuals with more latent/asymptomatic malaria parasitaemia have lower risk of hypertension and those with more acute/symptomatic malaria parasitaemia have a tendency toward higher BP. The cross-sectional nature of the study limited the distinction of short-term BP elevation (interim pathophysiological stress) from hypertension development. Future longitudinal studies considering malaria/hypertension phenotypes and host molecular variations are needed to clarify involved biological mechanisms, toward comorbidity management.

Key words : blood pressure, Côte d'Ivoire, hypertension, infectious disease, malaria, *Plasmodium*spp

Télécharger

RAPID SPREAD OF DOUBLE EAST- AND WEST-AFRICAN *kdr* MUTATIONS IN WILD *ANOPHELES COLUZZI* FROM CÔTE D'IVOIRE

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Journal : Wellcome Open Research
Année : 2019
Volume 15
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Pages : 31

Abstract

Malaria morbidity and mortality rates in Sub-Saharan Africa are increasing. The scale-up of long-lasting insecticidal nets and indoor residual spraying have been the major contributors to the decrease of malaria burden. These tools are now threatened by insecticide resistance in malaria vectors, which is spreading dramatically. After two different real-time polymerase chain reaction molecular characterizations carried out on 70 mosquitoes sampled in the locality of Elibou in southern Côte d'Ivoire, results revealed that 9 mosquitoes from *Anopheles coluzzi* harbored the double East- and West-African knockdown resistance mutations. In the previous year, only 1 mosquito out of 150 sampled from 10 regions of the country had the same genotype. These results show the rapid spread of insecticide resistance in malaria vectors and highlight the urgent need to diversify the methods of vector control in order to avoid the failure of insecticide-based vector control tools which may favor malaria fatalities.

Key words : Indoor residual spraying, Insecticides, Long lasting insecticidal bednet, Vector control, insecticide resistance, knockdown resistance

Télécharger

EVALUATION OF THE SENTINEL SURVEILLANCE SYSTEM FOR INFLUENZA-LIKE ILLNESSES IN THE GREATER ACCRA REGION, GHANA, 2018

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Journal : PLoS One

Année : 2019

Volume 14

N° 3

Pages : 0213-627

Abstract

Influenza-like Illness (ILI) is a medical diagnosis of possible influenza or another respiratory illness with a common set of symptoms. The deaths of four schoolchildren, during a pandemic influenza outbreak in December 2017 in Ghana, raised doubts about the ILI surveillance system's performance. We evaluated the ILI surveillance system in the Greater Accra region, Ghana, to assess the system's attributes and its performance on set objectives. METHODS: CDC guidelines were used to evaluate the data of the ILI surveillance system between 2013 and 2017. We interviewed the surveillance personnel on the system's description and operation. Additionally, routinely entered ILI data from the National Influenza Center provided by the six sentinel sites in Accra was extracted. We sampled and reviewed 120 ILI case-investigation forms from these sites. Surveillance activities were examined on system's performance indicators, each being scored on a scale of 1 to 3 (poorest to best performance). RESULTS: All population and age groups were under ILI surveillance over the period evaluated. Overall, 2948 suspected case-patients, including 392 (13.3%) children under-five were reported, with 219 being positive for influenza virus (Predictive value positive = 7.4%). The predominant influenza subtype was H3N2, recorded in 90 (41.1%) of positive case-patients. The system only met two out of its four objectives. None of the six sentinel sites consistently met their annual 260 suspected case-detection quota. Samples reached the laboratory on average 48 hours after collection and results were disseminated within 7 days. Of 120 case-investigation forms sampled, 91 (76.3%) were completely filled in. CONCLUSIONS: The ILI surveillance system in the Greater Accra region is only partially meeting its objectives. While it is found to be sensitive, representative and timely, the data quality was sub-optimal. We recommend the determination of thresholds for alert and outbreak detection and ensuring that sentinel sites meet their weekly case-detection targets.

Télécharger

IVERMECTIN DOSING STRATEGY TO ACHIEVE EQUIVALENT EXPOSURE COVERAGE IN CHILDREN AND ADULTS

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Journal : Clinical Pharmacology & Therapeutics

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Abstract

Ivermectin is a commonly-used broad-spectrum antiparasitic drug, yet doses that produce consistent exposure coverage across age have not been characterized and no data are available in children <15 kg. First, a population pharmacokinetic model is developed based on data from 200 children and 11 adults, treated with 100-600 mug/kg ivermectin. Second, model-based simulations are performed to identify a dosing strategy that achieves equivalent exposure coverage in children and adults. Median (90% confidence interval) clearance of 0.346 (0.12-0.73) L/h/kg in pre-school-aged (2-5 years) children is similar to 0.352 (0.17-0.69) L/h/kg in school-aged (6-12 years) children, but higher than in adults (0.199 (0.10-0.31) L/h/kg), resulting in significantly lower exposure in children following a 200 mug/kg dose. Simulations indicate that a dose increase to 300 and 250 mug/kg in children aged 2-5 and 6-12 years respectively, will achieve equivalent ivermectin exposure coverage in children and adults. This article is protected by copyright. All rights reserved.

Key words : children, clearance, dose optimization, exposure, ivermectin, population pharmacokinetics

Télécharger

EFFICACY AND SAFETY OF IVERMECTIN AND ALBENDAZOLE CO-ADMINISTRATION IN SCHOOLAGED CHILDREN AND ADULTS INFECTED WITH *TRICHURIS TRICHIURA* : STUDY PROTOCOL FOR A MULTI-COUNTRY RANDOMIZEDNCONTROLLED DOUBLE-BLIND TRIAL

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Journal : BMC Infectious Diseases

Année : 2019

Volume : 19

N° 1

Pages : 262

Abstract

BACKGROUND: Soil-transmitted helminthiasis affects almost 2 billion people worldwide in tropical climates. Preventive chemotherapy, using the benzimidazoles (albendazole and mebendazole) is the current main recommended control strategy. Nevertheless, there is limited efficacy of these drugs against hookworm infection and, to a greater extent, against trichuriasis. We describe a protocol for a trial investigating the efficacy and safety of the co-administration of ivermectin and albendazole against trichuriasis. **METHODS:** A double-blind, placebo-controlled randomized controlled trial will be conducted in three countries (Cote d'Ivoire, Tanzania and Lao PDR) with the aim to determine the efficacy, safety and extended effects of co-administered ivermectin and albendazole compared to standard albendazole monotherapy. We will enroll 600 participants aged 6-60 years in each setting. The primary outcome is cure rate (CR) against *Trichuris trichiura* infection as assessed by Kato-Katz 14-21 days after treatment. Secondary outcomes include CRs against concomitant soil-transmitted helminth (STH) infections (*Ascaris lumbricoides*, hookworm and *Strongyloides stercoralis*) and egg reduction rates (ERRs) against STH at 14-21 days, 180 days and 360 days. Tolerability of treatment, infection status assessed by polymerase chain reaction (PCR), and potential benefits of deworming on nutritional and morbidity indicators will be assessed. The primary analysis will include an available-case set and use logistic regression models adjusted for age, sex and weight. **DISCUSSION:** This trial will provide robust results on the efficacy and safety of co-administration of ivermectin and albendazole with the aim to better inform WHO recommendations on control of STHs. Furthermore, secondary and explanatory outcomes will provide direct evidence on the extended effects of combination therapy and insight on the relationship between nutrition and morbidity parameters and infection status and intensity.

Key words : Adolescent, Adult, Albendazole/*therapeutic use, Animals, Anthelmintics/*therapeutic use, Child, Double-Blind Method, Drug Therapy, Combination, Female, Humans, Ivermectin/*therapeutic use, Logistic Models, Male, Middle Aged, Trichuriasis/*drug therapy, *Trichuris, Young Adult, Albendazole, Cote d'Ivoire, Drug efficacy, Drug safety, Ivermectin, Lao PDR, Soil-transmitted helminthiasis, Tanzania, *Trichuris trichiura*

Télécharger

PHARMACOKINETICS OF ASCENDING DOSES OF IVERMECTIN IN *TRICHURIS TRICHIURA*-INFECTED CHILDREN AGED 2-12 YEARS

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Journal : Journal of Antimicrobial Chemotherapy
Année : 2019
Volume 74
N° 6
Pages : 1642-1647

Télécharger

Abstract

Yearly, millions of children are treated globally with ivermectin mainly for neglected tropical diseases. Anatomical, physiological and biochemical differences between children and adults may result in changes in pharmacokinetics. However, paediatric pharmacokinetic data of ivermectin are lacking. METHODS: In the framework of a randomized controlled dose-finding trial in rural Côte d'Ivoire, *Trichuris trichiura*-infected pre-school-aged children (PSAC, 2-5 years) and school-aged children (SAC, 6-12 years) were assigned to 100 or 200 mug/kg and 200, 400 or 600 mug/kg ivermectin, respectively (ISRCTN registry no. ISRCTN15871729). Capillary blood was collected on dried blood spot cards until 72 h post-treatment. Ivermectin was quantified by LC-MS/MS, and pharmacokinetic parameters were evaluated by non-compartmental analysis. RESULTS: C_{max} and AUC increased in PSAC and SAC with ascending doses and were similar in both age groups when the current standard dose (200 mug/kg) was administered (approximately 23 ng/mL and approximately 350 ng·h/mL, respectively). PSAC with lower BMI were associated with significantly higher AUCs. AUC and C_{max} were approximately 2-fold lower in children compared with parameters previously studied in adults, whereas body weight-adjusted CL/F (approximately 0.35 L/h/kg) was significantly higher in children. T_{max} (approximately 6 h), t_{1/2} (approximately 18 h), mean residence time (MRT_{INF}) (approximately 28 h) and V/F (approximately 8 L/kg) were similar in all paediatric treatment arms. CONCLUSIONS: A positive association of AUC or C_{max} with dose was observed in both age groups. Undernutrition might influence the AUC of ivermectin in PSAC. Ivermectin shows a lower exposure profile in children compared with adults, highlighting the need to establish dosing recommendations for different age groups.

PHARMACOKINETICS OF ALBENDAZOLE, ALBENDAZOLE SULFOXIDE, AND ALBENDAZOLE SULFONE DETERMINED FROM PLASMA, BLOOD, DRIED-BLOOD SPOTS, AND MITRA SAMPLES OF HOOKWORM-INFECTED ADOLESCENTS

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Journal : American Society for Microbiology Journal

Année : 2019

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Pages : 1642-1647

Abstract

Albendazole is an effective anthelmintic intensively used for decades. However, profound pharmacokinetic (PK) characterization is missing in children, the population mostly affected by helminth infections. Blood microsampling would facilitate PK studies in pediatric populations but has not been applied to quantify albendazole's disposition. Quantification methods were developed and validated using liquid chromatography-tandem mass spectrometry to analyze albendazole and its metabolites albendazole sulfoxide and albendazole sulfone in wet samples (plasma and blood) and blood microsamples (dried-blood spots [DBS]; Mitra). The use of DBS was limited by a matrix effect and poor recovery, but the extraction efficiency was constant throughout the concentration range. Hookworm-infected adolescents were venous and capillary blood sampled posttreatment with 400 mg albendazole and 25 mg/kg oxantel pamoate. Similar half-life ($t_{1/2} = \sim 1.5$ h), time to reach the maximum concentration ($t_{max} = \sim 2$ h), and maximum concentration ($C_{max} = 12.5$ to 26.5 ng/ml) of albendazole were observed in the four matrices. The metabolites reached C_{max} after ~ 4 h with a $t_{1/2}$ of ca. 7 to 8 h. A statistically significant difference in albendazole sulfone's $t_{1/2}$ as determined by using DBS and wet samples was detected. C_{max} of albendazole sulfoxide (288 to 380 ng/ml) did not differ among the matrices, but higher C_{max} of albendazole sulfone were obtained in the two microsampling devices (22 ng/ml) versus the wet matrices (14 ng/ml). In conclusion, time-concentration profiles and PK results of the four matrices were similar, and the direct comparison of the two microsampling devices indicates that Mitra extraction was more robust during validation and can be recommended for future albendazole PK studies.

Key words : Mitra, albendazole, dried-blood spot, pharmacokinetics

Télécharger

SPATIO-TEMPORAL POPULATION GENETIC STRUCTURE, RELATIVE TO DEMOGRAPHIC AND ECOLOGICAL CHARACTERISTICS, IN THE FRESHWATER SNAIL BIOMPHALARIA PFEIFFERI IN MAN, WESTERN CÔTE D'IVOIRE

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Journal : Genetica
Année : 2019
Volume : 147
N° 1
Pages : 33-45

Abstract

Yearly, millions of children are treated globally with ivermectin mainly for neglected tropical diseases. Anatomical, physiological and biochemical differences between children and adults may result in changes in pharmacokinetics. However, paediatric pharmacokinetic data of ivermectin are lacking. METHODS: In the framework of a randomized controlled dose-finding trial in rural Côte d'Ivoire, *Trichuris trichiura*-infected pre-school-aged children (PSAC, 2-5 years) and school-aged children (SAC, 6-12 years) were assigned to 100 or 200 µg/kg and 200, 400 or 600 µg/kg ivermectin, respectively (ISRCTN registry no. ISRCTN15871729). Capillary blood was collected on dried blood spot cards until 72 h post-treatment. Ivermectin was quantified by LC-MS/MS, and pharmacokinetic parameters were evaluated by non-compartmental analysis. RESULTS: C_{max} and AUC increased in PSAC and SAC with ascending doses and were similar in both age groups when the current standard dose (200 µg/kg) was administered (approximately 23 ng/mL and approximately 350 ng·h/mL, respectively). PSAC with lower BMI were associated with significantly higher AUCs. AUC and C_{max} were approximately 2-fold lower in children compared with parameters previously studied in adults, whereas body weight-adjusted CL/F (approximately 0.35 L/h/kg) was significantly higher in children. T_{max} (approximately 6 h), t_{1/2} (approximately 18 h), mean residence time (MRTINF) (approximately 28 h) and V/F (approximately 8 L/kg) were similar in all paediatric treatment arms. CONCLUSIONS: A positive association of AUC or C_{max} with dose was observed in both age groups. Undernutrition might influence the AUC of ivermectin in PSAC. Ivermectin shows a lower exposure profile in children compared with adults, highlighting the need to establish dosing recommendations for different age groups.

Key words : Spatio-temporal structure, Demography, Parasitic prevalence, Gene flow, *Biomphalaria pfeifferi*

Télécharger

MOLECULAR CHARACTERIZATION AND DISTRIBUTION OF SCHISTOSOMA CERCARIAE COLLECTED FROM NATURALLY INFECTED BULINID SNAILS IN NORTHERN AND CENTRAL COTE D'IVOIRE

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Journal : Parasites & Vectors
Année : 2019
Volume 12
N° 1
Pages : 117

Abstract

Accurate identification of schistosome species infecting intermediate host snails is important for understanding parasite transmission, schistosomiasis control and elimination. Cercariae emerging from infected snails cannot be precisely identified morphologically to the species level. We used molecular tools to clarify the distribution of the *Schistosoma haematobium* group species infecting bulinid snails in a large part of Cote d'Ivoire and confirmed the presence of interspecific hybrid schistosomes. METHODS: Between June 2016 and March 2017, *Bulinus* snails were sampled in 164 human-water contact sites from 22 villages of the northern and central parts of Cote d'Ivoire. Multi-locus genetic analysis (mitochondrial cox1 and nuclear ITS) was performed on individual schistosome cercariae shed from snails, in the morning and in the afternoon, for species and hybrid identification. RESULTS: Overall, 1923 *Bulinus truncatus*, 255 *Bulinus globosus* and 1424 *Bulinus forskalii* were obtained. Among 2417 *Bulinus* screened, 25 specimens (18 *B. truncatus* and seven *B. globosus*) shed schistosomes, with up to 14% infection prevalence per site and time point. Globally, infection rates per time point ranged between 0.6 and 4%. *Schistosoma bovis*, *S. haematobium* and *S. bovis* x *S. haematobium* hybrids infected 0.5%, 0.2% and 0.4% of the snails screened, respectively. *Schistosoma bovis* and hybrids were more prevalent in *B. truncatus*, whereas *S. haematobium* and hybrid infections were more prevalent in *B. globosus*. *Schistosoma bovis*-infected *Bulinus* were predominantly found in northern sites, while *S. haematobium* and hybrid infected snails were mainly found in central parts of Cote d'Ivoire. CONCLUSIONS: The data highlight the necessity of using molecular tools to identify and understand which schistosome species are transmitted by specific intermediate host snails. The study deepens our understanding of the epidemiology and transmission dynamics of *S. haematobium* and *S. bovis* in Cote d'Ivoire and provides the first conclusive evidence for the transmission of *S. haematobium* x *S. bovis* hybrids in this West African country.

Key words : Animals, *Bulinus*/*parasitology, Cote d'Ivoire, Female, Humans, Male, Molecular Typing, Phylogeography, *Schistosoma haematobium*/classification/genetics/*isolation & purification, Schistosomiasis haematobia/parasitology/transmission, Seasons, *Bulinus forskalii*, *Bulinus globosus*, *Bulinus truncatus*, Molecular markers, *Schistosoma bovis*, *Schistosoma haematobium*, Schistosome hybrids

Télécharger

INFLUENCE OF THE KNOWLEDGE OF PATIENTS CONSULTING AT THE TREICHVILLE ANTIRABIES CENTER ON ADHERENCE TO POST-EXPOSURE PROPHYLAXIS

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Journal : Genetica
Année : 2019
Volume : 67
N°2
Pages : 92-97

Abstract

AIM: Human rabies is a major public health problem in many African countries, including Ivory Coast. The objective of this study was to evaluate the influence of human rabies knowledge on compliance with post-exposure prophylaxis. **MATERIALS AND METHODS:** We conducted a descriptive and analytical cross-sectional study from September 2014 to May 2015 at the Abidjan Rabid Center, Treichville. After having given their consent, were interviewed, patients who came for a first consultation and who gave a mobile phone number available for the appointment reminder after abandoning or not starting the post-exposure prophylaxis. Data were processed with Epi Info version 3.5.3. Pearson's chi-square test and Fisher's exact test were used for statistical analysis with a significance level of 5%. **RESULTS:** A total of 744 patients were interviewed. Men accounted for the majority (58.2%) of those surveyed, with a sex ratio (M/F) of 1.7. The average age of patients was 24.55 (+/-17.3) years. The analysis showed that 42.6% (317/744) of the interviewees had heard of human rabies. However, having heard of human rabies did not influence adherence to post-exposure prophylaxis ($P>0.05$). Nevertheless, the post-exposure prophylaxis regimen was completed more often by subjects who knew that agitation is a sign of rabies than those who did not ($OR_a=0.4343$, 95%CI=[0.204-0.925]). Subjects knowledgeable about disease transmission (animal bites) were less likely to continue their post-exposure prophylaxis than those unaware of this relationship ($OR_a=8.544$, 95%CI=[1.002-72.869]). **CONCLUSION:** The main factors identified in this study that influenced the observance of post-exposure prophylaxis were knowledge of the manifestation of human rabies (signs of agitation) and of the mode of transmission of this disease (animal bites). With a view for better prevention against human rabies, rural and urban populations should be informed, educated and sensitized about this 100% life-threatening but vaccination-preventable disease.

Key words : Abidjan, Compliance, Côte d'Ivoire, Human rabies, Knowledge, Observance

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DAP 6

Santé Humaine et Animale

Depuis plusieurs décennies, la croissance démographique, les mouvements migratoires, l'urbanisation, les besoins alimentaires sont des défis à relever dans les contextes en pleine mutation des pays en développement. Les dégradations de l'environnement transforment le milieu et occasionnent un rapprochement entre les populations humaines et animales. Ces contextes épidémiogènes sont favorables aux maladies infectieuses et non-infectieuses dont 70% sont à caractère zoonotique. Nous visons ici le renforcement de la lutte

intégrée contre les maladies à l'interface Homme-Animaux-Ecosystème et palier les conséquences économiques et sociales qui en découlent. Cela nécessite une approche holistique, transdisciplinaire et multisectorielle telle que préconisé par le concept "One Health" et une synergie entre la médecine humaine et la médecine vétérinaire. Les acquis de ces recherches serviront aux décideurs et acteurs de développement pour la mise en œuvre de programmes de surveillance sanitaire et au renforcement durable du système de santé.

4 Articles scientifiques dans 4 journaux avec 7 contributeurs du CSRS.



Le CSRS travail activement à l'atteinte des Objectifs de Développement Durable (ODD) par le biais de 8 priorités thématiques appelées Domaines d'Activités Principales (DAP).



Photo : Contexte épidémiogène favorable à la transmission de maladies tropicales | Credits photo : Kigbaori D. Silué

ANTAGONISTIC EFFECTS OF PLASMODIUM-HELMINTH CO-INFECTIONS ON MALARIA PATHOLOGY IN DIFFERENT POPULATION GROUPS IN CÔTE D'IVOIRE

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Journal : American Society for Microbiology Journal

Année : 2019

Volume : 13

N°1

Pages : 0007086

Abstract

INTRODUCTION: *Plasmodium* spp. and helminths are co-endemic in many parts of the tropics; hence, co-infection is a common phenomenon. Interactions between *Plasmodium* and helminth infections may alter the host's immune response and susceptibility and thus impact on morbidity. There is little information on the direction and magnitude of such interactions and results are conflicting. This study aimed at shedding new light on the potential interactions of *Plasmodium* and helminth co-infections on anemia and splenomegaly in different population groups in Côte d'Ivoire.

METHODOLOGY: Parasitologic and clinical data were obtained from four cross-sectional community-based studies and a national school-based survey conducted between 2011 and 2013 in Côte d'Ivoire. Six scenarios of co-infection pairs defined as *Plasmodium* infection or high parasitemia, combined with one of three common helminth infections (i.e., *Schistosoma mansoni*, *S. haematobium*, and hookworm) served for analysis. Adjusted logistic regression models were built for each scenario and interaction measures on additive scale calculated according to Rothman et al., while an interaction term in the model served as multiplicative scale measure.

PRINCIPAL FINDINGS: All identified significant interactions were of antagonistic nature but varied in magnitude and species combination. In study participants aged 5–18 years from community-based studies, *Plasmodium*-hookworm co-infection showed an antagonistic interaction on additive scale on splenomegaly, while *Plasmodium*-*Schistosoma* co-infection scenarios showed protective effects on multiplicative scale for anemia and splenomegaly in participants aged 5–16 years from a school-based study.

CONCLUSIONS/SIGNIFICANCE: No exacerbation from co-infection with *Plasmodium* and helminths was observed, neither in participants aged 5–18 years nor in adults from the community-based studies. Future studies should unravel underlying mechanisms of the observed interactions, as this knowledge might help shaping control efforts against these diseases of poverty.

Key words : Adolescent, Adult, Aged, Aged, 80 and over, Anemia/epidemiology/pathology, Child, Child, Preschool, Coinfection/*pathology, Côte d'Ivoire, Cross-Sectional Studies, Female, Hookworm Infections/*complications, Humans, Malaria/*complications/*pathology, Male, Middle Aged, Population Groups, Pregnancy, Schistosomiasis/*complications, Splenomegaly/epidemiology/pathology, Young Adult

Télécharger

ASSESSING THE PRESENCE OF WUCHERERIA BANCROFTI INFECTIONS IN VECTORS USING XENOMONITORING IN LYMPHATIC FILARIASIS ENDEMIC DISTRICTS IN GHANA

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Journal : Trop Med Infect Dis
Année : 2019
Volume 4
N°1
Pages : 1-13

Abstract

Mass drug administration (MDA) is the current mainstay to interrupt the transmission of lymphatic filariasis. To monitor whether MDA is effective and transmission of lymphatic filariasis indeed has been interrupted, rigorous surveillance is required. Assessment of transmission by programme managers is usually done via serology. New research suggests that xenomonitoring holds promise for determining the success of lymphatic filariasis interventions. The objective of this study was to assess *Wuchereria bancrofti* infection in mosquitoes as a post-MDA surveillance tool using xenomonitoring. The study was carried out in four districts of Ghana; Ahanta West, Mphohor, Kassena Nankana West and Bongo. A suite of mosquito sampling methods was employed, including human landing collections, pyrethrum spray catches and window exit traps. Infection of *W. bancrofti* in mosquitoes was determined using dissection, conventional and real-time polymerase chain reaction and loop mediated isothermal amplification assays. *Aedes*, *Anopheles coustani*, *An. gambiae*, *An. pharoensis*, *Culex* and *Mansonia* mosquitoes were sampled in each of the four study districts. The dissected mosquitoes were positive for filarial infection using molecular assays. Dissected *An. melas* mosquitoes from Ahanta West district were the only species found positive for filarial parasites. We conclude that whilst samples extracted with Trizol reagent did not show any positives, molecular methods should still be considered for monitoring and surveillance of lymphatic filariasis transmission.

Key words : *Anopheles melas*; Ghana; lymphatic filariasis; post-mass drug administration surveillance; *Wuchereria bancrofti*; xenomonitoring

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POTENTIAL FACTORS INFLUENCING LYMPHATIC FILARIASIS TRANSMISSION IN “HOTSPOT” AND “CONTROL” AREAS IN GHANA: THE IMPORTANCE OF VECTORS

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Journal : Infectious Diseases of Poverty
Année : 2019
Volume : 8
N°1
Pages : 9

Télécharger

Abstract

Background: Mass drug administration (MDA) programmes for the control of lymphatic filariasis in Ghana, have been ongoing in some endemic districts for 16 years. The current study aimed to assess factors that govern the success of MDA programmes for breaking transmission of lymphatic filariasis in Ghana.

Methods: The study was undertaken in two “hotspot” districts (Ahanta West and Kassena Nankana West) and two control districts (Mpohor and Bongo) in Ghana. Mosquitoes were collected and identified using morphological and molecular tools. A proportion of the cibarial armatures of each species was examined. Dissections were performed on *Anopheles gambiae* for filarial worm detection. A questionnaire was administered to obtain information on MDA compliance and vector control activities. Data were compared between districts to determine factors that might explain persistent transmission of lymphatic filariasis.

Results: High numbers of mosquitoes were sampled in Ahanta West district compared to Mpohor district ($F = 16.09$, $P = 0.002$). There was no significant difference between the numbers of mosquitoes collected in Kassena Nankana West and Bongo districts ($F = 2.16$, $P = 0.185$). *Mansonia* species were predominant in Ahanta West district. *An. coluzzii* mosquitoes were prevalent in all districts. *An. melas* with infected and infective filarial worms was found only in Ahanta West district. No differences were found in cibarial teeth numbers and shape for mosquito species in the surveyed districts. Reported MDA coverage was high in all districts. The average use of bednet and indoor residual spraying was 82.4 and 66.2%, respectively. There was high compliance in the five preceding MDA rounds in Ahanta West and Kassena Nankana West districts, both considered hotspots of lymphatic filariasis transmission.

Conclusions: The study on persistent transmission of lymphatic filariasis in the two areas in Ghana present information that shows the importance of local understanding of factors affecting control and elimination of lymphatic filariasis. Unlike Kassena Nankana West district where transmission dynamics could be explained by initial infection prevalence and low vector densities, ongoing lymphatic filariasis transmission in Ahanta West district might be explained by high biting rates of *An. gambiae* and initial infection prevalence, coupled with high densities of *An. melas* and *Mansonia* vector species that have low or no teeth and exhibiting limitation.

Key words : Ghana, Hotspots, Lymphatic filariasis, Mass drug administration, Microfilariae, Systematic noncompliance, Vector contro

USE OF ANOPHELES SALIVARY BIOMARKER TO ASSESS SEASONAL VARIATION OF HUMAN EXPOSURE TO ANOPHELES BITES IN CHILDREN LIVING NEAR RUBBER AND OIL PALM CULTIVATIONS IN CÔTE D'IVOIRE

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Journal : Parasite Epidemiology
and Control
Année : 2019
Volume 5
N°1
Pages : 00102

Abstract

Environmental changes related to agricultural practices and activities can impact malaria transmission. In the objective to evaluate this impact on the human-vector contact, the level of human exposure to Anopheles vector bites was assessed by an immuno-epidemiological indicator based on the assessment of the human IgG antibody response to the *Anopheles gambiae* gSG6-P1 salivary peptide, previously validated as a pertinent biomarker. Two cross-sectional surveys were carried out in the dry and rainy season in three villages with intensive agricultural plantations (N'Zikro with rubber cultivation, Ehania-V5 and Ehania-V1 with palm oil exploitation) and in a control village without plantations (Ayébo). Overall, 775 blood samples were collected in filter papers from children aged 1 to 14 years-old for immunological analysis by ELISA. The IgG levels to the gSG6-P1 salivary peptide significantly differed between studied villages both in the dry and the rainy seasons ($P < 0.0001$) and were higher in agricultural villages compared to the control area. In particular, the level of specific IgG in Ehania-V5, located in the heart of palm oil plantations, was higher compared to other agricultural villages. Interestingly, the level of specific IgG levels classically increased between the dry and the rainy season in the control village ($P < 0.0001$) whereas it remained high in the dry season as observed in the rainy season in agricultural villages. The present study indicated that rubber and oil palm plantations could maintain a high level of human exposure to Anopheles bites during both the dry and rainy seasons. These agricultural activities could therefore represent a permanent factor of malaria transmission risk.

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DAP 7

Systèmes sociaux

Nous nous appuyons sur les dynamiques socioculturelles, économiques, institutionnelles, politiques et environnementales observées dans les sociétés contemporaines pour questionner leurs capacités de recomposition et de ré-inventivité sociale et institutionnelle. Les activités de recherche dans ce domaine s'intéressent particulièrement à la démocratie, la justice, la cohésion sociale, les

élections et conflits, l'autochtonie, la citoyenneté, la gestion des ressources naturelles, la consolidation de la paix, la gouvernance et l'administration publique. Plusieurs approches des sciences sociales dans une logique inter et transdisciplinaire sont mobilisées à cet effet. Les résultats attendus viendront éclairer la gouvernance des institutions au bénéfice des populations locales.

1 Article
scientifique dans
1 journal avec
1 contributeur du
CSRS.



Le CSRS travail activement à l'atteinte des Objectifs de Développement Durable (ODD) par le biais de 8 priorités thématiques appelées Domaines d'Activités Principales (DAP).



Photo : Jeunes adolescents en plein échange. Sud de la Côte d'Ivoire | Crédits photo : Christian Heuss

RESEARCH, MENTORSHIP AND SUSTAINABLE DEVELOPMENT: IS RETIREMENT AGE A HURDLE TO RESEARCH SUSTAINABILITY IN AFRICA?

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Journal : BMJ Global Health

Abstract

Background : Retirement age in most of sub-Saharan Africa is between 55 and 60 years, even in academic and research institutions. There is no mechanism to retain even the few most experienced and outstanding among them. There is evidence that institutions retaining experienced researchers access better large research grants.

Methods : We conducted literature review and shared views and experiences among peer research scientists

Results : Most African scientists obtain their first degrees aged 25–30 years. Economic needs compounded with work experience requirements for PhD studies delay their research career development such that most PhD graduates are 40–50 years of age. However, unlike in the developed world where the majority acquire their PhDs in their late 20's or early 30's, there is no mechanism to retain them longer at work to maximise their contributions to scientific developments. Instead, African scientists are forced to retire young at 60 years of age. On the contrary, developed countries scientists graduate earlier, work longer and have retention mechanisms even after retirement. African countries do not consider retaining even the few who have demonstrated outstanding performance.

Consequently, outstanding research scientists retire at the time when they are needed most. They seek and get jobs abroad or in externally owned projects (brain drain). Their decade or so of work, generates more resources abroad, depriving Africa of resource generating capacity. Secondly, retiring at the height of their performance is economically counterproductive.

Thirdly, this affects negatively the career development of young scientists for lack of experienced supervisors and mentors.

Conclusion : Africa must rethink the retirement age of its research scientists and create incentives to retain outstanding research scientists who reach retirement age. This is urgently needed to stop brain drain, contribute to economic development, and accelerate ongoing efforts to build sustainable research capacity and mentorship programmes in Africa.

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DAP 8

Economie de l'environnement et du Développement local

Nous nous appuyons sur les dynamiques socioculturelles, économiques, institutionnelles, politiques et environnementales observées dans les sociétés contemporaines pour questionner leurs capacités de recomposition et de ré-inventivité sociale et institutionnelle. Les activités de recherche dans ce domaine s'intéressent particulièrement à la démocratie, la justice, la cohésion sociale, les

élections et conflits, l'autochtonie, la citoyenneté, la gestion des ressources naturelles, la consolidation de la paix, la gouvernance et l'administration publique. Plusieurs approches des sciences sociales dans une logique inter et transdisciplinaire sont mobilisées à cet effet. Les résultats attendus viendront éclairer la gouvernance des institutions au bénéfice des populations locales.

1 Article scientifique dans
1 journal avec
1 contributeur du CSRS.



Le CSRS travail activement à l'atteinte des Objectifs de Développement Durable (ODD) par le biais de 8 priorités thématiques appelées Domaines d'Activités Principales (DAP).



Photo : Jeunes adolescents en plein échange, Sud de la Côte d'Ivoire | Crédits photo : Christian Heuss

TYPОLOGY, TECHNICAL EFFICIENCY AND SCALE ECONOMY OF DIBITERIES IN DAKAR, SENEGAL.

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Abstract

Background Retirement age in most of sub-Saharan Africa is between 55 and 60 years, even in academic and research institutions. There is no mechanism to retain even the few most experienced and outstanding among them. There is evidence that institutions retaining experienced researchers access better large research grants.

Methods We conducted literature review and shared views and experiences among peer research scientists Results Most African scientists obtain their first degrees aged 25–30 years. Economic needs compounded with work experience requirements for PhD studies delay their research career development such that most PhD graduates are 40–50 years of age. However, unlike in the developed world where the majority acquire their PhDs in their late 20's or early 30's, there is no mechanism to retain them longer at work to maximise their contributions to scientific developments. Instead, African scientists are forced to retire young at 60 years of age. On the contrary, developed countries scientists graduate earlier, work longer and have retention mechanisms even after retirement. African countries do not consider retaining even the few who have demonstrated outstanding performance.

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