

## A CASE OF EXTENDED EXUDATIVE DERMATITIS IN AN INDIAN RHINO (*RHINOCEROS UNICORNIS*)

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### Addresses

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### Summary

A five-year-old male Indian rhino (*Rhinoceros unicornis*) suffered from an extended exudative dermatitis on his lower abdomen and his legs. Numerous  $\beta$ -haemolytic streptococci were found. Treatment with Betadine<sup>®</sup>, a lotion containing 1% Chlorhexidine + 2% Clotrimazole + 0.15% Betamethasone was successful. The significance of the microbiological diagnosis is discussed.

### Zusammenfassung

Ein 5-jähriger Indischer Panzernashornbulle (*Rhinoceros unicornis*) litt unter ausgedehnter, exsudativer Dermatitis am Unterbauch und an den Beinen. Im Exsudat wurde ein hoher Gehalt an  $\beta$ -haemolytischen Streptokokken gefunden. Die Behandlung mit Betadin<sup>®</sup>, einer Lotion mit 1% Chlorhexidin + 2% Clotrimazol + 0.15% Betamethason war erfolgreich. Die Bedeutung des mikrobiologischen Befundes wird diskutiert.

### Résumé

Cet article décrit une dermatite exsudative étendue au ventre et aux pattes d'un rhinocéros des Indes mâle (*Rhinoceros unicornis*). Une grande quantité de streptocoques  $\beta$ -hémolytiques furent trouvés dans l'exsudat. Le traitement avec de la bétadine<sup>®</sup>, une lotion contenant 1% de chlorhexidine + 2% de clotrimazole + 0.15 % de betamethasone fut un succès. L'importance du résultat microbiologique est discutée.

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### Key words

Indian Rhinoceros, dermatitis,  $\beta$ -haemolytic streptococci, treatment

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### Introduction

Since 1951, Basel Zoological Gardens has been keeping greater one-horned rhinoceroses (*Rhinoceros unicornis*). A total of 28 births have been recorded in Basel, including one stillbirth and one abortus.

The zoo veterinarians were confronted with various diseases:

- chronic interstitial pneumonia (9), the allergic origin of which („Farmer's Lung" caused by spores of *Micropolyspora faeni*) could later be confirmed by serological tests (8),
- one case of torsion of the colon,
- one case of a fracture of the spine,
- problems with chronic pododermatitis of the hind feet, which affected different males (12),

- one case of superficial, secondarily purulent palm-sized efflorescences in skin folds (6) and another case of greasy and smelly coatings in skin folds (earlier examinations detected *Aeromonas*) were mentioned in postmortem reports.

## Case Report

On 25 October 1999, the veterinarian in charge was called because visitors had seen the male rhino „Jaffna“ (born in San Diego Wild Animal Park on 18 March 1994) scratching his abdomen on the rough surface of the soil with stretched hind legs in order to alleviate a severe pruritus. Later on, he was lying on his left side, and the two female rhinos of the group were licking his abdomen. His general condition was not affected and his appetite normal.

The altered areas of the skin (approximately one square metre), located on the caudal abdomen and the medial surfaces of the hind legs revealed a purulent dermatitis, covered with a dirty and bad smelling exudate. A similar dermatosis was found at the edges of both ears and at the points of contact with the skin of the neck.

For microbiological diagnosis, two swabs were taken from the abdomen and sent in transport medium to the Institute for Veterinary Bacteriology in Berne. Gram staining revealed the presence of Gram positive cocci and Gram negative rods; no yeasts were seen on the smears. Cultures on standard laboratory media grew numerous  $\beta$ -haemolytic streptococci within a mixed flora of coagulase-negative staphylococci and nonfermentative Gram-negative rods. The streptococci showed a biochemical pattern consistent with *S. dysgalactiae* in conventional tube tests, whereas identification with the ATB 32 Strep system led to a profile (15132161131) not represented in the database. At least three reactions, including the presence of a strong pyrrolidonyl arylamidase were atypical for *S. dysgalactiae*. The strain was grouped with the Prolex Streptococcal Grouping Kit (Prolab, Canada) and did not react with any of the Lancefield groups represented in the kit (groups A, B, C, D, F, and G). The nearest relatives of the isolate based on partial sequencing of its 16S rDNA were several strains of *S. dysgalactiae*; however, over the sequenced length of 1370 base pairs, the sequence of the Rhino isolate diverged at five to nine positions from typical sequences of *S. dysgalactiae* available in genebanks. To sum up, the available evidence shows that the  $\beta$ -haemolytic streptococcus isolated from the skin lesion in the case described above resembles, but is clearly distinct from *S. dysgalactiae*.

We also took samples by scraping with a scalpel the border of the affected skin on the abdomen, the hind legs and the edges of the ears. The samples were further analyzed under the microscope after pre-treatment with KOH. No parasites and no fungi could be detected although contamination impaired the analysis. The cultivation on Mercoplate® Sabouraud 2% Glucoseagar revealed growth of molds such as *Penicillium* and *Aspergillus*, which we consider as being contaminants. No dermatophytic infection could be detected.

At the same time, the affected areas were washed daily with Betadine® soap and sprayed with Betadine® Solution. After six days, the skin had nearly dried up (Figure 1 and 2). Since there was no further improvement, and the pruritus had not completely disappeared, the rhino received a starting dose of 6 Bactrim forte® tablets (correspondent with 4.8 g Sulfamethoxazole + 0.96 g Trimethoprim TMP), which was later reduced to 5 Bactrim forte® tablets/day (correspondent with 4.0 g SMZ + 0.8 g TMP) - for 4 days. On top of it, „Jaffna“ received a local treatment of Excipial U Hydrolotion® (emollient with 4% urea) with 1% Chlorhexidine + 2% Clotrimazole + 0.15% Betamethasone (manufactured by Spirig AG, prescription M. Pletscher).

One week later, the dermatitis had further normalised and the itch stopped. Treatment with Betadine® soap in the morning and U-Hydrolotion® mixture in the afternoon continued. However, new red spots were detected on the back of the forelegs and consequently, treatment was extended to these areas. Nine weeks after starting to use Betadine®, we decided to discontinue the whole treatment since we observed a good response. The acute signs of inflammation and pruritus had disappeared, but the new skin had still a rosy shade instead of the typical grey-brown colour. Two weeks later, a new therapeutic attempt was started with a watery inorganic iodine solution (Iodi solutio glycolica, Formularium Helveticum 1.2) being applied to the forelegs, which proved to be very successful. Iodine is well known for its excellent antibacterial and antifungal effects. In January 2000, the edges of the new skin started to be pigmented again. (Figure 3 and 4). „Jaffna“ remained very calm during the whole treatment and the sampling procedures because it provided relief of the pruritus and also because of his friendly character.



Figure 1: Abdomen and hind leg after one week's treatment with Betadine®



Figure 2: Left ear after one week's treatment with Betadine®



Figure 3: Abdomen and hind leg after 10 weeks' combined treatment with Betadine® and U-Hydro lotion®



Figure 4: Left ear after 10 weeks' combined treatment with Betadine® and U-Hydro lotion®

## Discussion and Conclusions

Since Betadine® has worked only partially and Bactrim® could not prevent the spread of the dermatitis, we think that the topical product containing Chlorhexidine, Clotrimazole and Betamethasone had the best effect. This combination acts on bacterial and fungal growth. The corticosteroid Bethamethasone quickly reduced the inflammation and the pruritus, which had caused intense scratching and a possible superinfection.

The reports available in the current literature list *Malassezia pachydermatis* in addition to bacteria as possible agents of dermatitis in rhinos (4). In the present case, gram stained smears were negative for yeasts including *M. pachydermatis*; however, smears are of limited sensitivity, and the presence of this yeast cannot therefore be entirely ruled out. On the other hand, streptococci are well known pathogens, able to cause dermatitis in a wide range of hosts. Though dermal problems and diseases in both African and Indian rhinos have been reported several times (2, 3, 5, 7, 10), we are aware of only two reports on  $\beta$ -haemolytic streptococci in rhinos (1, 7). The isolates were reported to belong to Lancefield group L but were otherwise not further examined. Since many species of streptococci appear to have a limited host range, the data reported here are consistent with the existence of a new  $\beta$ -haemolytic streptococcus resembling *S. dysgalactiae*, which belongs to a rare Lancefield group in rhinos.

We did not check this animal on Vitamin A deficiency, which might be one reason for a low resistance of the skin against infection (11). The vitamin A status of plasma, milk and liver has previously and repeatedly been estimated in other individuals to exclude a hypovitaminosis in the whole group. We think that our treatment of this sort of dermatitis could be a good option.

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