

Comment

Infected animal-bite wounds usually involve bacteria originating from the oropharyngeal flora of the animal. *A. lignieresii* has been isolated from the mouths of normal cattle and sheep but may cause disease—for example, “wooden tongue” of cattle—in these animals. Surprisingly, it is not a microbe primarily associated with horses, but the closely related species, *Actinobacillus equuli*, may be found in the oral flora of normal horses.¹

The pathogenic role of *A. lignieresii* in this infection seems certain. Human infections are extremely rare and to our knowledge this is the first report from Scandinavia and one of the few confirmed cases in the world. We know of only one other isolate from an animal (horse) bite wound.¹ It is possible that *A. lignieresii* may be more common than reports suggest because it may easily be confused with *Pasteurella* sp as it was by us² and others³ initially. Differentiation of these organisms is not easy but may be achieved by using a fairly wide range of biochemical reactions.¹

The risk of infection must always be considered when treating an animal-bite wound. *A. lignieresii* should be recognised as a potential cause of wound infection after bites by larger domestic mammals.

We thank Dr R E Weaver, Special Bacteriology Section, Center for Disease Control, Atlanta, USA for examining our isolate and confirming the identification.

¹ Weaver RE, Hollis DG. Gram-negative fermentative bacteria and *Francisella tularensis*. In: Lennette EH, ed. *Manual of clinical microbiology*. 3rd ed. Washington, DC: American Society for Microbiology, 1980: 242-62.

² Dibb WL, Digranes A. Characteristics of 20 human *Pasteurella* isolates from animal bite wounds. *Acta Pathol Microbiol Scand [B]* (in press).

³ Pauckova V, Laskova H, Krakovic B. *Actinobacillus lignieresii* human infection. *Zentralbl Bakteriol [orig A]* 1973;224:489-91.

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Further observations on serum free thyroxine concentrations during pregnancy

In a previous communication¹ we reported that serum free thyroxine (FT4) concentrations fall appreciably during pregnancy. The commercial kit which we used then was an indirect method of measuring FT4, though Kurtz *et al*² using a direct method published results which gave some support to our original data. Two new direct methods for measuring FT4 have recently become available commercially. We have used them to repeat our study.

Patients, methods, and results

Blood was taken from clinically euthyroid pregnant women undergoing routine check-ups. About 20 women in each trimester of pregnancy were

selected, and 20 euthyroid non-pregnant female members of staff of similar age range volunteered as controls for the study. No one in the control group was taking a contraceptive pill. We measured FT4 using Amerlex and LiquiSol FT4 kits, total T4 by our in-house and Tetrak-Peg kits, and thyroxine binding globulin (TBG) by RIA-gnost TBG kits. The T4:TBG ratio was calculated. The results are shown in the table.

Results from the two FT4 kits showed no correlation in any of the four groups. With the Amerlex kit the mean for the control group was not significantly different from the mean of the first-trimester group but was highly significantly different from the mean of the second- and third-trimester groups. Twenty per cent of the results lay outside the manufacturer's reference range. With the LiquiSol kit none of the means were significantly different from the mean of the control group, though the mean of the third-trimester group was significantly different from that of the first- and second-trimester groups. All values lay within the manufacturer's reference range. Changes in T4 and TBG were similar to those found in our original study, in which we used different methods for measuring these variables. In particular TBG rose more rapidly than either T4 or FT4 during the first trimester. Furthermore, the T4:TBG ratio again showed a pronounced downward trend during pregnancy, and in this study 56% of values in the third trimester were lower than those in the control range (previous study 58%). A recent paper³ suggests that a modified version of this ratio is clinically useful in patients who do not have TBG concentrations outside the normal range. Our data suggest that when TBG concentrations are raised the validity of this simple ratio must surely be in doubt.

Comment

This limited comparative study emphasises the unresolved contradictions even when FT4 is measured directly. It has generally been assumed that FT4 concentrations remain constant during pregnancy despite the changes in TBG and T4 concentrations, but several observers have shown a fall in FT4 with gestational age.⁴ In this study the mean value of the third-trimester samples when assayed by the LiquiSol kit was not significantly different from the mean value of the control group samples, whereas the opposite was true with the Amerlex kit. We cannot yet be certain whether the FT4 concentration changes during pregnancy, and we cannot therefore say which of the two kits reflects the true physiological state. If the observed fall in FT4 is true then an additional reference range for pregnancy might be helpful to the clinician. If not, then some explanation must be found by way of method or artefact.

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¹ Boss AMB, Kingstone D. Serum free thyroxine in pregnancy. *Br Med J* 1979;ii:550.

² Kurtz A, Dwyer K, Ekins R. Serum free thyroxine in pregnancy. *Br Med J* 1979;ii:551.

³ Fyffe JA, Ayoub L, Cohen HN, Turner JG, Thomson JA, Ratcliffe JG. Clinical and laboratory evaluation of four methods of assessing free thyroxine status in thyroid clinic patients. *Ann Clin Biochem* 1980;17: 334-8.

⁴ Ekins RP. Methods for the measurement of free thyroid hormones. In: *Free thyroid hormones: proceedings of the international symposium held in Venice, December 1978*. Amsterdam: Excerpta Medica, 1979:72-92. (International congress series no 479.)

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FT4, T4, and TBG concentrations and T4:TBG ratios. Results are means (and 95% confidence ranges)

	FT4 (Amerlex kit) (pmol/l)	FT4 (LiquiSol kit) (pmol/l)	T4 (nmol/l)	TBG (mg/l)	T4:TBG
Controls	20.5 (29.9-11.1)	18.7 (23.9-13.5)	90 (118-63)	20 (25-16)	4.5 (5.9-3.1)
First-trimester group	19.1 (29.3-8.7)	20.6 (27.4-13.8)	122 (168-76)	35 (50-19)	4.0 (5.2-2.8)
Second-trimester group	16.4 (28.0-4.8)	20.2 (27.0-13.4)	148 (210-85)	45 (60-30)	3.3 (4.7-1.9)
Third-trimester group	13.4 (18.4-8.4)	17.6 (22.2-13.0)	131 (177-86)	48 (63-32)	2.8 (3.8-1.8)

Conversion: SI to traditional units—FT4: 1 pmol/l \approx 0.0008 μ g/100 ml. T4: 1 nmol/l \approx 0.08 μ g/100 ml.