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6.6. *In Vivo* Skin Capillary Abnormalities in Vinyl Chloride Workers

H. R. MARICQ, M. N. JOHNSON, C. L. WHETSTONE, and E. C. LeROY

Some workers exposed to vinyl chloride (VC) have been found to have clinically detectable proliferative and fibrotic lesions of the periphery (acroosteolysis, Raynaud's phenomenon, and sclerodermalike skin plaques) and the viscera (angiosarcoma and hepatic fibrosis, Banti type) (Harris and Adams, 1967; Wilson *et al.*, 1967; Dinman *et al.*, 1971; Jühe and Lange, 1972; Falk *et al.*, 1974; Lange *et al.*, 1974; Marsteller *et al.*, 1975; Thomas *et al.*, 1975).

Techniques of wide-field capillary microscopy have shown distinctively abnormal patterns in patients with spontaneous Raynaud's syndrome and scleroderma, as well as a strong positive correlation between severity of capillary pattern abnormality and visceral involvement (Maricq and LeRoy, 1973; Maricq *et al.*, 1974). Therefore, these techniques were used to examine 152 VC workers (44 selected, 108 unselected) and 50 control manual workers not exposed to VC.

In 44 VC workers selected for known disease (angiosarcoma, hepatic fibrosis, acroosteolysis, Raynaud's phenomenon, and skin lesions), 39% had capillary abnormalities, of which 16% were sclerodermalike patterns and 23% were isolated, discrete capillary lesions.

The possibility that trauma and not VC was the cause of capillary abnormalities in VC workers, many of whom had been reactor cleaners, was studied by comparing 108 VC workers and 50 manual workers outside the VC industry.

The results showed (Table I) that capillary abnormalities were significantly more common in the VC-exposed group than in non-VC manual workers ($\chi^2 = 15.50$, $df = 2$, $p < 0.001$). More of the selected VC workers with VC-specific lesions (angiosarcoma, hepatic fibrosis, severe acroosteolysis, and fibrotic skin changes) had capillary abnormalities than did VC workers with inactive, stable, or nonspecific lesions (healed acroosteolysis, nonspecific skin rashes, and Raynaud's phenomenon alone) ($\chi^2 = 13.85$, $df = 1$, $p < 0.001$). Among the 108 VC employees, no correlation was found between capillary abnormalities and length of employment or length of reactor-cleaning assignment.

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TABLE I. Comparison of Capillary Observations between Employees of VC Industry and Manual Workers Not Exposed to VC

Capillary observations	Employees of VC industry	Manual workers not exposed to VC	χ^2	p
Definitely SD-like capillary pattern	11	0	15.50	< 0.001
Abnormal capillaries present, but few in number	27	3		
No capillary abnormalities seen	70	47		

These data suggest that 10% or more of the VC workers (unselected or selected) have capillary abnormalities which are not found in non-VC manual workers. These capillary changes are present in VC workers in higher proportion than are clinically overt lesions (Wilson *et al.*, 1967; Dinman *et al.*, 1971). Further studies are needed to compare these capillary changes with those seen in blood vessels and endothelia in animals exposed to VC (Maltoni and Lefemine, 1975). Capillary microscopy could then be used as a reproducible, noninvasive technique to monitor VC workers and identify VC-related vascular diseases in "susceptible" individuals at an early and possibly preventable stage.

References

- Dinman, B. D., Cook, W. A., Whitehouse, W. M., Magnuson, H. J., and Dicheck, T., 1971, Occupational acroosteolysis. I. An epidemiological study, *Arch. Environ. Health* 22:61.
- Falk, H., Creech, J. L., Heath, C. W., Johnson, M. N., and Key, M. M., 1974, Hepatic disease among workers at a vinyl chloride polymerization plant, *J. Am. Med. Assoc.* 230:59.
- Harris, D. K., and Adams, W. G. F., 1967, Acro-osteolysis occurring in men engaged in the polymerization of vinyl chloride, *Br. Med. J.* 3:712.
- Jühe, S., and Lange, C. E., 1972, Sklerodermieartige Hautveränderungen, Raynaud-Syndrom und Akroosteolysen bei Arbeitern der PVC-herstellenden Industrie, *Dtsch. Med. Wochenschr.* 97:1922.
- Lange, C. E., Jühe, S., Stein, G., and Veltman, G., 1974, Die sogenannte Vinylchlorid-Krankheit—Eine berufsbedingte Systemkleroze? *Int. Arch. Arbeitsmed.* 32:1.
- Maltoni, C., and Lefemine, G., 1975, Carcinogenicity bioassays of vinyl chloride: Current results, *Ann. N.Y. Acad. Sci.* 246:195.
- Maricq, H. R., and LeRoy, E. C., 1973, Patterns of finger capillary abnormalities in connective tissue diseases by wide-field microscopy, *Arthritis Rheum.* 16:619.
- Maricq, H. R., Spencer-Green, G., and LeRoy, E. C., 1974, Abnormal capillary patterns

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- and systemic disease in scleroderma, Proceedings of the Eighth European Conference for the Microcirculation, Le Touquet.
- Marsteller, H. J., Lebach, W. K., Müller, R., and Gedigk, P., 1975, Unusual splenomegalic liver disease as evidenced by peritoneoscopy and guided liver biopsy among polyvinyl chloride production workers, *Ann. N.Y. Acad. Sci.* **246**:95.
- Thomas, L. B., Popper, H., Berh, P. D., Selikoff, I., and Falk, H., 1975, Vinyl-chloride induced liver disease: From idiopathic portal hypertension (Banti's syndrome) to angiosarcomas, *N. Engl. J. Med.* **292**:17.
- Wilson, R. H., McCormick, W. E., Tatum, C. F., and Creech, J. L., 1967, Occupational acroosteolysis, *J. Am. Med. Assoc.* **201**:577.

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