CORRESPONDENCE

Basal cell carcinoma after frequent episodes of cutaneous erythema and peeling induced by welding

We report a case of basal cell carcinoma located at the sternal angle in a 45 year old boilermaker, who had experienced frequent episodes of welding induced cutaneous erythema and peeling at this site during his 28 year career.

He presented with a 25 mm x 20 mm skin lesion overlying the sternal angle which had been present for 6 months. The lesion was excised and histology confirmed the clinical diagnosis of basal cell carcinoma. Before he was told the diagnosis he gave a history of frequent episodes of cutaneous erythema and peeling at the sternal angle. These episodes occurred after welding on days when the V neck of his shirt was open, thereby exposing the skin to ultraviolet radiation. He estimated this had occurred between once a week and once a month for most of his career. During the first 4 years of his career he undertook manual metal arc welding (MMAW) of mild steel. During the following 24 years he undertook mostly gas metal arc welding (GMAW) of mild steel. He occasionally undertook gas tungsten arc welding (GTAW) and submerged arc welding (SAW). He occasionally welded aluminium, stainless steel and cast iron. He lived in the United Kingdom until 7 years old when he moved to Mount Isa, Queensland, Australia, where he remained. He denied regular outdoor recreation as an adult although he did swim regularly as a child. He had a fair complexion, green eyes, and light brown hair. He stated that he did not tan easily, and that he developed sunburn more easily—skin phenotype SPT 1. No solar keratoses were found on the face or hands.

Welding induced cutaneous erythema is a recognised condition caused by excessive ultraviolet radiation. Ultraviolet exposure at the sternal angle in these welders is a risk factor for the subsequent development of skin cancer. We think that our case is the first report of skin cancer occurring at the site of previous episodes of welding induced cutaneous erythema. The absence of solar keratoses on the hands and face, which are normally covered during welding, suggests that recreational exposure to solar ultraviolet in this tropical location was limited. His skin phenotype (SPT 1) is a recognised risk factor for sunburn and solar ultraviolet induced skin cancer. It is possible that his skin phenotype rendered him more susceptible to welding induced cutaneous erythema and skin cancer. The latent period of 28 years from the commencement of welding ultraviolet exposure and the first episode of welding induced cutaneous erythema to the development of skin cancer in this case is biologically plausible.

Work related respiratory symptoms in radiographers

In 1996 we reported findings from follow up of a large national cohort of radiographers. The study aimed to assess the nature and scale of a possible respiratory hazard from x-ray processing chemicals. In an initial postal survey of all radiographers who registered in the United Kingdom between 1985 and 1989, we found a clear excess of work related lower respiratory symptoms compared with a control group of physiotherapists. On the face of it, this could represent a high prevalence of occupational asthma, so to explore the question further we sought serial peak flow measurements from 231 radiographers who reported work related wheeze or chest tightness in the postal survey. Among 235 subjects who reported work related wheeze or chest tightness in the past 3 months and were invited to carry out serial peak flow measurements.

Fifty one radiographers with current wheeze or chest tightness agreed to undertake peak flow monitoring. They were instructed in the appropriate technique at regional workshops, or in a few cases where this was not possible, by telephone. Peak flow monitoring was measured with a micro Wright peak flow meter, the best of three consecutive readings being recorded at 2 hourly intervals during waking hours over a period of 4 weeks. For most subjects the recording period included a break from work of a week or longer. The peak flow records were plotted graphically and analysed by a panel of four doctors with expertise in occupational respiratory disease, who independently classified them according to whether they indicated asthma, and if so whether the asthma was related to work.

Twenty usable peak flow records were returned, of which 10 showed evidence of asthma (eight definite and two possible). However, none of the records showed a consistent fall in mean daily peak flow or increase in variability of peak flow on working days compared with non-working days. In the view of the panel none could be classified as showing definite occupational asthma. Three records were considered to show possible occupational asthma.

We recognise that this follow up survey was limited by the few eligible subjects who completed satisfactory peak flow records. The incomplete response could have caused considerable bias if it led to the exclusion of an important number of radiographers with occupational asthma and this was possible at several stages. Firstly, there may have been cases of occupational asthma among non-responders to the first or second questionnaire. Secondly, some radiographers with occupational asthma may have been excluded from serial peak flow monitoring because they were no longer working. Finally, despite our efforts to encourage compliance, only a few of those who agreed to monitoring completed satisfactory peak flow records and cases of occupational asthma may have been missed as a consequence.

We think it unlikely, however, that there was major underascertainment. If anything we would expect radiographers with work related respiratory symptoms to have responded more readily to the initial questionnaire than those without. And of the 180 who answered the questionnaire and reported symptoms suggestive of occupational asthma but did not attempt peak flow monitoring, at the most only three had ever left a job because of respiratory symptoms. Moreover, none of the subjects whose peak flow records were unavailable had been diagnosed as having occupational asthma.

In summary, although we cannot exclude the possibility that some cases in our original cohort have been missed, our findings indicate that occupational asthma in radiographers is rare. The follow up study adds useful information to the earlier report of an excess of respiratory symptoms in a cohort of radiographers, suggesting that at most only a small part of this excess is likely to be attributable to occupational asthma.

JULIA SMEDLEY
PAUL CULLINAN
ANTHONY FRIEW
ANTHONY NEWMAN-TAYLOR

MRC Environmental Epidemiology Unit, University of Southampton, Southampton General Hospital, Southampton SO9 4XY, UK

Correspondence to: Dr Julia Smedley, MRC Environmental Epidemiology Unit, University of Southampton, Southampton General Hospital, Southampton SO9 4XY, UK


Air pollution research in the United Kingdom

Government funded air pollution research in the United Kingdom began in the 1950s as a response to the London smog of 1952. Professor P J Lawther was appointed as the Director of the Medical Research Council (MRC) Air Pollution Research Unit, and with able colleagues, undertook seminal studies that are regarded as landmarks in the field. The Unit closed in the late 1970s.

In the early 1990s, it became clear that the United Kingdom was lagging behind other countries in research on the effects of air pollutants on health and that air pollution was still damaging health. The scale of the effects was unclear but work from the United States suggested that it was larger than expected. In 1994, a workshop was held at the MRC Institute for Environment and Health (IEH) in Leicester. This workshop drew together recommendations that had been made by several expert advisory committees, identified gaps in knowledge, and drew up a list of priorities for a new research programme. The focus was on research that would have an impact on Government policy. The meeting had far reaching consequences: in October 1994 a call for research proposals was published jointly by the Department of Health, the (then) Department of the Environment, and the Medical Research Council. Proposals were received, peer reviewed, and 25 projects were funded—the United Kingdom was back in the field.

Each year since 1995, a review of the programme, which has expanded and now includes work on indoor air pollutants, has been held at the IEH. The review held in April this year involved 41 research teams and ran for 3 days. Highlights of the review included:

- Work on the chemical composition of the ambient aerosol using the latest scanning electron microscope techniques coupled with electron probe x ray microanalysis methods.
- Volunteer studies that reported effects of exposure to air pollutants on variability of heart rate.
- Epidemiological work showing changes in red cell counts associated with daily variations in pollutant concentrations.
- Time series studies of the associations between daily variations in concentrations of pollutants and a wide range of health effects including deaths and hospital admissions.
- Volunteer studies of the effects of diesel exhaust involving bronchoalveolar lavage after exposure and measurement of airway antioxidants.
- Studies of the patterns of exposure of people to air pollutants both indoors and outdoors.
- Calculation of the shortening of life due to long term exposure to air pollutants.

This research programme has had a considerable effect on policy in the United Kingdom. The current policy is laid out in the United Kingdom National Air Quality Strategy—a revision of the strategy was published in early 1999. One of the key functions of the annual air pollution research review is to aid government departments in identifying the need for further research and in offering guidance as to its direction. Much remains to be done. A full report of the discussions will be published by the IEH but a few areas are worth listing here:

- The need to clarify exposure-response relations so that the benefits of reducing levels of pollution may be calculated more accurately.
- The need to understand the mechanism of action of ambient particles: our understanding of this is still almost negligible.
- The need to understand the effects of long term exposure to current concentrations of air pollutants.
- The need to identify groups with notably greater than average sensitivity to air pollutants.

These issues will be considered in a new research initiative that the Departments of Health and of the Environment, Transport, and the Regions intend to launch this year.

All this is encouraging. Emissions of air pollutants in the United Kingdom are falling, but effects on health still occur. Understanding these effects and identifying the most effective and efficient measures for further reductions in concentrations will be the challenge for the early years of the new century.

R. L. MAYNARD
Department of Health

BOOK REVIEWS

If you wish to order, or require further information regarding the titles reviewed here, please write or telephone the BMJ Bookshop, PO Box 295, London WX1H 9TE. Tel: 0171 383 6244. Fax: 0171 383 6662. Payment can be made by cheque in sterling drawn on a UK bank, or by credit card (MasterCard, VISA, or American Express) stating card number, expiry data, and your full name. (The price and availability are occasionally subject to revision by the Publishers.)


This is the eagerly awaited 3rd edition of what has become the international standard textbook for aviation medicine. It is intended primarily for the experienced practitioner engaged in military or civil aviation medicine, but is also directed at those involved in other disciplines of the life sciences in aviation.

Ernsting is the highly respected guru of aviation medicine in the United Kingdom. After a long and distinguished career in the Royal Air Force (mostly at the Institute of Aviation Medicine, Farnborough), he is now visiting professor in human and applied physiology and head of human physiology and aerospace medicine at King's College, London.

Nicholson is a former commandant of the RAF School of Aviation Medicine and is visiting professor of aviation medicine, human physiology and aerospace medicine at King's College, London.

Rainford continues to serve in the Royal Air Force as clinical director, and is a consultant to the United Kingdom Civil Aviation Authority.

It is thus no surprise that this book is comprehensive and authoritative, being particularly strong in human physiology and the physiological effects of the aviation environment. There is no attempt to cover space medicine, which is expanding into a specialty in its own right.

The book is divided into three parts, covering aviation physiology and aircrew systems, clinical aviation medicine and operational aviation medicine. The editors have been largely successful in achieving a unity of style throughout, which is no mean feat given more than 40 contributors. There is an inconsistency in the fact that many chapters end with a further reading list, which in some cases is not as comprehensive as expected, whereas other chapters end with a detailed reference list. Some of the diagrams have been carried through successively from the first edition and are beginning to look a little tired.

This edition is about 30% shorter than its predecessor, which in turn was shorter than the two volume format of the first edition. This is a tribute to tight editing, but I searched in vain for detailed information on commercial aircraft medical kits. The chapter dealing with the health of the airline passenger is a reprint of the basic guidelines issued by the Aerospace Medical Association. I would have expected an authoritative text to have a wider and deeper consideration of one

NOTICE

International course: Principles and Methods of Epidemiologic Research


The lecturer is KJ Rothman. Among others, the topics will be: case-control research principles, interaction in aetiology, statistics v epidemiologic analyses. Enrollment is open to researchers having basic knowledge of epidemiology and biostatistics and at least some work experience. Closing date for enrollment is 17 January 2000. Course fee: DFL 1950, including a single room with shower/toilet, breakfast, lunches, dinner, coffee/tea during breaks, class notes.

Further information from: Ms Astrid van Alst, Course secretary, Department of Epidemiology, University of Nijmegen, PO Box 9101, NL-6500 HB Nijmegen, The Netherlands. Telephone 00 31 24 3619132; Fax 00 31 24 3613505; email A.VanAlst@me.kun.nl


of the more important issues facing practiti-
oners of civil aviation medicine.

The military pedigree of the distinguished
editors is evident throughout. This is not a
serious criticism, but the broader issues of
the civilian aviation environment (particularly
the commercial considerations) deserve
wider exposition.

Despite its high price, this volume is essen-
tial reading for candidates for the Diploma in
Aviation Medicine, and should be on the
bookshelf of every practitioner of aviation
medicine. However, I cannot yet bring myself
to throw away my old copy of Gilles Textbook
of aviation physiology!

MICHAEL BAGSHAW

Lung biology in health and disease
series. Vol 100. Edited by: JOHN A
McDonald (Pp 740; £215.00) 1997. New
York: Marcel Dekker. ISBN: 0-8247-
9772-8.

This is the 100th volume of this series and it
is interesting to compare it with one of the
caller ones entitled “Development of the
Lung. Vol 6”. The intervening years have
seen an explosion in our knowledge of the
lung and this book must be almost twice as
big as its predecessor but even so it has not
been able to encompass all the new develop-
ments in the field. Nevertheless, the editors
have made an interesting choice on what to
include, balancing old favourites with newer
areas of interest and overall I think that they
have done justice to the main advances that
have taken place since volume 6. The more
traditional topics have not been neglected but
have been brought up to date.

The first chapter, almost de rigueur nowa-
days in a book on this subject, is by Burri. He
presents consistently high standard beautiful
histological pictures which with the accompa-
nying diagrams make a very clear exposition
of how the lung develops in three dimensional
space. This chapter also contains collected
basic morphometric data on the lung which is
always useful. Another regular is the chapter
on pulmonary surfactant, as always meticu-
lously researched and referenced by Ballard
assisted by Odom. But perhaps it is not fair to
pick out some authors when most of the con-
tributor’s names will be familiar to those
interested in lung physiology and the leading
researchers in their respective areas have been
chosen to write each topic.

Newer topics have been introduced, as
should be the case in a book of this quality.
They include chapters on the transcription
factors important in development of certain
cellular components, on various components
of the lung intercellular matrix including
laminin, collagens, and elastic fibres and on
the role of neuropeptides in lung develop-
ment. The volume ends with some interesting
chapters, which are quite appropriately in-
cluded, on lung injury to the developing lung,
on in vitro models of lung development, and
on the hormonal control of compensatory
lung growth.

I found it a wonderful volume to dip into. It
will be an excellent reference and teaching
resource for some time to come for it is dif-
cult to think of where else such a concen-
tration of high quality chapters on lung develop-
ment could be obtained. I have two reserva-
tions, however. Firstly, a volume of this
nature would be expected to be a little out of
date by the time it is published but even so
it seems that the most recent references
included are only those up to 1996, suggest-
ing a delay somewhere along the publishing
line. Secondly the price of £215 puts it way
beyond the reach of any student (and indeed
of most teachers and perhaps even of well
endowed libraries); one wonders at what
market the publishers are aiming. Nevertheless,
my copy will remain in a very good quality
glossy paper on which the book is
printed is a real bonus.

D V WALTERS

Approaches to Predicting Toxicity from
Occupational Exposure to Dusts, IEH
report R11. Edited by: Linda, Shuker, Len,
Levy. (Pp 144; £25) 1999. Leicester:
Institute for Environment and Health. ISBN
1 899 110 20 8.

This report of a workshop at the Institute for
Environment and Health is a fairly compre-
hensive and timely summary of the current
conflicting interpretations of the effects of
low solubility particles. The workshop was
convened by the Health and Safety Execu-
tive. This shows in the subject matter which
concentrates on the implications of the more
recent discoveries for standard setting and
risk assessment.

Occupational health professionals, aware
of the historical problems with dusts, want
materials classified into broad groups with
simple rules to regulate exposure. For a time
it seemed that the concept of low toxicity
dusts, with the respirable fraction as a magic
number to separate the possible long term
responses from the shorter term reactions—
such as irritation or allergy—might fill this
need. Lung tumours in rats after massive
exposures to “inert” dusts and recent obser-
vations that very fine particles provoke differ-
ent responses, caused a reappraisal.

The problem is that the subject is still
largely in the descriptive phase with no real
knowledge of mechanism to provide a secure
basis for classification or regulation. Almost
all industrial exposures are to mixtures of
dusts with composition varying over time. Add
to this the often substantial delay
between exposure and effect and patchy
exposure records: the chance of establishing
secure causative associations by epidemi-
ological investigations in shifting populations
is not good.

Academics dip into the subject from time
to time often without a real understanding of
the problem but with a conviction that their
latest cytokine provides the unifying link to
the diversity of biology in this area. All too
often they find the problems intractable and
withdraw.

Industrial researchers have generally con-
cluded their efforts to product defence. A few
companies recognised the potential value of a
sound scientific base for this and the sector
has made a significant contribution to the
science in recent years, although the real
breakthrough continues to be elusive.

All these disciplines were represented at
this workshop so the diversity of approach is
evident from the text, even though the
pragmatists were in the majority. Students
and those involved with industrial safety will
find the summaries in this volume invaluable
as the information is difficult to glean from
the diverse literature.

The discussion section is less enlightening,
with frank conflict in places. Thus, the carci-
nogenic responses found in rats at very high
dust levels are discounted as reflecting
“overload”—a response without direct paral-
lel in other rodent species and humans. Even
so, evaluation of new particulates in a rat
model is advocated. Workshops of this type
usually result in bland conclusions. Those
with revolutionary ideas tend to apply them
rather than share them in open forum.
Research to date has been the usual mixture
of the thoughtful and the pragmatic: with
a tendency for pragmatism to predominate.

Nevertheless the need for more (multi disci-
plinary) research was identified (is there an
Institute for Environment and Health forum
which has concluded otherwise?). The real
need is for an improved dialogue between the
interested parties which might just lead to a
new and informative approach to the prob-
lems. This publication is a useful contribu-
tion.

At £25 this slim volume seems expensive,
reflecting the specialist audience.

G H PIGOTT