

lated 15-fold. Conversely, the mRNA expression of K2e was down-regulated more than 1000-fold.

By using keratinocytes grown in a reconstructed skin model, the retinoid regulation of K2e and K4 expression was further investigated. Retinoids with various affinities for the nuclear receptors RAR and RXR were added to the culture and the keratin mRNA expression was monitored for several days. The most potent retinoids were found to be RAR α agonists, the effects of which could be inhibited by addition of a panRAR antagonist.

In conclusion, several novel keratin mutations have been shown to cause epidermolytic hyperkeratosis, and a

few examples of a pertinent genotype/phenotype correlation have been found. Treatment with retinoids seems more useful in patients carrying a K10 mutation than in those carrying a K1 mutation, possibly because the former are less vulnerable to the pronounced down-regulation of K2e also seen in normal skin. Keratin 4 is a sensitive marker for retinoid activity in the skin, both on the mRNA and protein level, compared to CRABP II. This up-regulation of K4 and the down-regulation of K2e seems to be mediated through RAR α , a nuclear receptor expressed in the keratinocytes. This opens up the possibility of designing new drugs which will hopefully be more effective in treating, for example, bullous ichthyosis due to K2e mutations (Siemens type).

List of original publications

The thesis is based upon the following papers:

- I. Virtanen M, Kaye Smith S, Gedde-Dahl Jr T, Vahlquist A, and Bowden PE. Novel spontaneous keratin mutations (KRT1 and KRT10) causing epidermolytic hyperkeratosis in Scandinavia. Manuscript.
- II. Virtanen M, Gedde-Dahl Jr T, Mörk N-J, Leigh I, Bowden PE, Vahlquist A. Phenotypic/genotypic correlations in patients with epidermolytic hyperkeratosis and the effects of retinoid therapy. *Acta Derm Venereol* 2001; 81: 163-170
- III. Virtanen M, Törmä H, Vahlquist A. Keratin 4 up-regulation by retinoic acid *in vivo*. A sensitive marker for retinoid bioactivity in human epidermis. *J Invest Dermatol* 2000; 114: 487-493.
- IV. Virtanen M, Törmä H, Rollman O, Sirsjö A, Vahlquist A. Keratins 2e and 4 in reconstituted human skin are reciprocally regulated by retinoids, acting via the nuclear receptor RAR α . Manuscript

Adolescent Sexuality and Sexual Abuse – A Swedish Perspective

Karin Edgardh

Department of Venhälsan, Södersjukhuset, Karolinska Institute, Stockholm
karin.edgardh@ullevall.no

Dr Edgardh is specialized in dermatovenereology and gynaecology. At present, Dr Edgardh holds a position at the Department of Venereology, Olafia Clinic, Ullevål University Hospital, Oslo.

In the late 1980s, teenage abortions and genital chlamydial infections were increasing adolescent health prob-

lems in Sweden, indicating unsafe sex practices among young people. The emergence of HIV highlighted the need for research on adolescent sexual health issues. The national cross-sectional questionnaire-based survey, SAM 73-90, was conducted in 1990 among 1,943 high school students and 210 school drop-outs born in 1973. The response rate was high, 92% and 44%, respectively. Consensual sexual experience was varied. Coital experience was reported by 54% of the boys and 64% the girls. Factors associated with coital experience were early puberty, not living with both parents, vocational study program or school non-attendance, and risk-taking behaviour with regard to smoking, alcohol and drugs. Non-coital sexual experience included cunnilin-

gus and fellatio. Early starters, with the first heterosexual intercourse before age 15, reported risky sexual behaviour with multiple partners, casual sex and varied sexual practices as part of a generalized adolescent risk-taking behaviour. Consequently, early starters were, compared to later starters, at increased risk for unwanted pregnancy and sexually transmitted infections. School drop-outs constituted a group at risk.

Child sexual abuse was reported by 11.2% of female and 3.1% of male students, and by 28% of female and 4% of male non-schoolers. Alcohol and drug abuse, along with suicidal ideation, was reported significantly more often by abused youths of both gen-

ders. Girls reporting abuse were overrepresented among the early starters of coital activity. Few adolescents had told any "professional" about the abuse.

Medicolegal examinations of girls alleging abuse confirmed the findings from SAM 73-90. Adolescent girls alleging sexual abuse may exhibit signs of admitted self-inflicted extragenital injury. Diagnosis of alleged non-acute cases of sexual abuse relies on a detailed history. Genital examination confirms that non-penetrative sexual acts leave no lasting signs, but that repeated abusive genital penetration may do that. Few cases were taken to court. In cases with a confessing perpetrator, no discordance was found between the testimony of the victim, the medicolegal conclusion and the testimony of the perpetrator.

HIV has not become epidemic in Sweden, and teenage abortions and chlamydial infections decreased in the early 1990s. Since 1995, a shift has occurred, with a gradual increase of abortions and STDs. The questionnaire-based study SEXSAM-99 was performed among 258 high-school students in a low income multicultural suburb in the greater Stockholm area in 1999. The participants' mean age was 17 years, with a response rate of 76%. School drop-outs could not be reached. Experience of vaginal intercourse was reported by 56%, with no gender difference. Factors associated with coital experience were the same as in SAM 73-90. Drug use, casual sex, multiple partners, homo- and bisexual experience and anal intercourse were reported



Dr Karin Edgardh defended her thesis on May 29th, 2001, at Söder Hospital, Stockholm. Faculty Opponent was Professor Gun-Britt Löwhagen, Dept of Dermatovenereology, Sahlgrenska Hospital, Göteborg Chairman was Professor Eric Sandström, Dept of Venhälsan (Gay Men's Health Clinic), Söder Hospital, Karolinska Institutet, Stockholm. Ass Professor Lennart Emtestam, Dept of Dermatovenereology, Huddinge Hospital, Stockholm; Professor Kristina Berg Kelly, Dept of Pediatrics, Sahlgrenska Hospital, Göteborg; Professor Viveca Odland, Dept of Obstetrics and Gynecology, Karolinska Hospital, Stockholm; Ass Prof Carl-Fredrik Wahlgren, Dept of Dermatovenereology, Karolinska Hospital, Stockholm and Ass Prof Peter Lidbrink, Dept of Dermatovenereology, Huddinge Hospital, Stockholm, had acted as faculty reviewers. Co-author Prof Kari Ormstad, National Institute for Forensic Medicine, Rikshospitalet, Oslo, attended the dissertation. From left to right, first row: Emtestam - Edgardh - Berg Kelly - Odland - Löwhagen, second row: Lidbrink - Wahlgren - Sandström - Ormstad.

more frequently than in SAM 73-90, with no difference with regard to gender or ethnic background. These findings may indicate a shift in adolescent sexual behaviour, an issue for further investigations.

List of original publications

- I. Edgardh K, Lewin B, Nilsson BR. Sexual experience and behaviour as reported by 17-year-old girls and boys in Sweden. *Scand J Sex* 1999; 2: 41-60.
- II. Edgardh K. Sexual behaviour and early coitarche in a national sample of 17-year-old Swedish girls. *Sex Transm Inf* 2000; 76: 98-102.
- III. Edgardh K. Sexual behaviour and early coitarche in a national sample of 17-year-old Swedish boys. (Accepted by *Acta Paed Scand*, 2001.)
- IV. Edgardh K, Ormstad K. Prevalence and characteristics of sexual abuse in a national sample of Swedish 17-year-old boys and girls. *Acta Paed Scand* 2000; 88: 310-319.
- V. Edgardh K, von Krogh G, Ormstad K. Adolescent girls investigated for sexual abuse - history, physical findings and legal outcome. *Forensic Sci Int* 1999; 104: 1-15.
- VI. Edgardh K. Sexual behaviour in a multicultural high school setting in Stockholm. (Accepted by *Int J STD AIDS*, 2001.)