ANABOLIC STEROIDS AND NORWEGIAN WEIGHTLIFTERS

S. SOLBERG*

Medical Student, University of Tromsø, Medical School, 9001 TROMSØ, Norway

ABSTRACT

The mean bodyweight, in kilograms, and mean weightlifting result, in points, for the ten best weightlifters at the annual Norwegian championships 1962-82 have been studied. During the 21 years, the mean bodyweight for these ten increased by 18 kg, probably due to the effect of androgens. The weightlifting results improved rapidly from 1968 onwards, probably reflecting an increasingly widespread use of anabolic steroids by Norwegian weightlifters. In 1977 doping tests were introduced, and from then on, rate of improvement has increased much more slowly.

The annual sale of anabolic steroids 1963-81 and testosterone 1974-81, in Norway have been recorded. The sale of anabolic steroids increased irregularly until 1974-75, and has since shown a 42% decrease. The sale of testosterone 1974-81 showed a slight reduction, thus giving no support to the suggestion that doping tests for anabolic steroids would lead to a transfer to testosterone abuse.

Key words: Weightlifting, Anabolic steroids, Testosterone, Bodyweight.

INTRODUCTION

Anabolic steroids probably found their way into Norwegian sport in the early nineteen sixties. In 1976 Norwegian sports authorities decided to introduce random doping tests from January 1977. It is impossible to unravel completely the development of drug taking and the possible effect of the introduction of doping tests. Weightlifting, however, is a sport which lends itself to analysis by statistical methods, so that a reflection of drug taking trends may be obtained. The bodyweight of each weightlifter is measured and recorded at every competition. The results in weightlifting are scored objectively and they depend on muscle development more than in other forms of athletics.

The aim of the present paper is to study the development of bodyweight and weightlifting results of top Norwegian weightlifters, during the past two decades.

The recorded annual sale of anabolic steroids 1963-81 and testosterone 1974-81 in Norway are also presented.

MATERIALS AND METHODS

Bodyweights and weightlifting results have been extracted from the official protocols of the Norwegian championships 1962-82. During 1962-72 three events were recorded: press, snatch, and clean-and-jerk. The press was eliminated from 1973 onwards. The sum of the lifts in kilograms is multiplied with a coefficient

dependent on bodyweight to give the result in points. The coefficient, used in Norway, decreases from 1.000 at 49 kg, to 0.632 at 125 kg. Here, the mean bodyweight, in kilograms, and the mean result, in points, for the ten best weightlifters in each year will be given.

Data on the sale of anabolic steroids in each of the years 1963-81, and testosterone in 1974-81 have been obtained from the records of Norsk Medisinaldepot (State drug wholesale monopoly).

Regression lines have been computed, and differences in slope tested, according to the usual formula (Nielsen et al, 1976).

RESULTS

Table I and parts A and B of Fig. 1 give the means for bodyweight and weightlifting results. The discontinuity in part B of the figure, caused by the elimination of the press, is corrected for by an arbitrary shifting upwards of the scale for 1973-82.

Both bodyweight and points show a large increase in the course of the 21-year period. The computed bodyweight regression line for 1962-82 has a slope of 0.88 kilograms per year, statistically highly significant. In part B the dotted lines are regression lines computed for the intervals 1962-68, 1968-72 and 1973-82. It should be noted that the periods have been selected after inspection of the data. With this reservation the difference between the slopes of 2.73 points per year in 1962-1968 and 11.02 points per year in 1968-72 is significant ($p < 0.001$). The slope of 1973-82 is 1.43 points per year. The slopes of 1973-76 (3.70 per year) and 1976-82 (1.25 per year) have also been tested, and do not differ significantly.

*Present address:

Dr. S. Solberg, MD,
Kongsberg Sykehus,
3,600 Kongsberg, Norway

Fig. 1: Part A: Mean bodyweight for the ten best weightlifters at the annual Norwegian championships 1962-82. The dotted line is the regression line.

Part B: Mean points (kilograms lifted x coefficient) for the ten best weightlifters at the annual Norwegian championships 1962-82. The dotted lines are the regression lines for 1962-68, 1968-72 and 1973-82. Note the discontinuity and shift of scale 1972-73, caused by elimination of press from 1973 onwards.

Part C: Annual sale of androgens in Norway. AS: Entire group of anabolic steroids 1963-81. M: Metenolone (to selling preparation in the AS group). T: Testosterone preparations 1974-81.

TABLE I

Norwegian weightlifting championships 1962-82. Bodyweight and points (kilograms lifted x coefficient) for the ten best athletes in each year.

	Points		Bodyweight (kg)	
	Mean	SD	Mean	SD
1962	254.5	10.9	77.6	12.0
1963	258.4	12.7	78.3	11.5
1964	257.7	16.1	81.0	8.1
1965	268.1	17.2	78.7	8.0
1966	260.7	18.3	80.1	12.0
1967	271.4	12.6	81.6	8.8
1968	270.3	16.5	81.1	9.4
1969	286.7	24.7	83.8	13.3
1970	288.6	14.8	88.0	11.3
1971	305.6	22.7	85.8	11.1
1972	316.0	22.5	86.6	13.0

Note: Press excluded from 1973 onwards.

	Points	SD	Bodyweight (kg)	SD
1973	201.7	14.6	79.9	8.1
1974	208.2	10.3	84.8	12.5
1975	208.1	10.8	91.6	15.3
1976	214.1	9.1	87.0	17.9
1977	210.3	8.1	93.9	18.1
1978	207.1	8.3	88.7	11.7
1979	213.4	6.3	94.9	11.9
1980	211.7	8.4	94.3	9.1
1981	216.6	9.2	93.6	13.3
1982	220.0	10.7	94.8	11.7

Part C of Fig. 1 shows the sale curves (daily doses per 1,000 inhabitants) 1963-82 for anabolic steroids as well as for metenolone, the top selling preparation in the group. Testosterone is shown for 1974-81. The anabolic steroid sale increased irregularly until a maximum in 1974-75, and then a 42% reduction, from the 1975 level, until 1981. Only partial parallelism is found between the steroid curve and the weightlifting results, and is probably suggestive rather than striking.

DISCUSSION

The mean bodyweight for the athletes studied has increased by 0.88 kilograms per year during the 21-year period. This is greater than reported for military conscripts in Norway (Statistical Yearbook 1981) as well as for the general population (Forsdahl, 1981). It is suggested that this increase reflects the weight-increasing effect of anabolic steroids (Fahey et al, 1973; Freed et al, 1975 and Strømme et al, 1974). However, it cannot be excluded that a gradual selection towards heavier athletes has taken place due to the characteristics of the table of coefficients used for computing the result points.

It may be questioned whether the mean points for

the ten best athletes at the annual championship is the best index for studying the development of Norwegian weightlifting. However, I believe that no other index would obviously be preferable.

The findings indicate that an increase in the rate of result improvement occurred in 1968. Consultations with weightlifters who were active at the time, support the idea that this acceleration is a consequence of increasing intake of anabolic steroids. The improvement in results came to an end around 1976. This may reasonably be attributed to the introduction of doping tests and the preceding debate in Norway.

Any conclusions based on correlations between two variables as weightlifting results and sale of anabolic steroids must, for numerous reasons, be careful. Many, and different factors influence the two, and it is not certain that the athletes obtain all their supplies in Norway. Even so, interesting similarities found are worth mentioning. It should be noted that the championships are held in February/March, so that any drugs influencing the results would have been taken the previous year.

During the past 6 years the sale of anabolic steroids has decreased by 42% of the 1975 level. This reduction may partly be attributed to the introduction of doping tests. More important, however, may be a change in treatment of cancer patients, with metenolone being given every second week instead of the earlier weekly injections.

The exact use of hormones in sports is difficult to determine, but some data exist: In Sweden, Ljungqvist (1975) found in a questionnaire sent to 144 top male athletes that 99 (69%) answered, and among these, 31% confirmed the use of anabolic steroids. Most of the users were throwers, and a few runners or jumpers were included. At the Nordic championship in 1974, 25 (68%) of the 37 participating weightlifters answered a questionnaire, and 6 (24%) of these said that they used anabolic steroids (Solberg, 1974). Haug et al (1974) asked the 40 best Norwegian weightlifters about their use of anabolic steroids. Fifteen (38%) answered, and 13 (87%) confirmed use. Each of these 15 estimated the percentage of hormone-users at the World championships to be 90-100%, and at the Norwegian championships to be about 75%. Nine of the 13 had decided themselves to start to use anabolic steroids, and 4 started after advice or pressure from others. The 13 had started their use from 1968 to 1973. I have calculated the reported use of these 13 to be 0.003 daily doses per 1,000 inhabitants. A rough estimate that these 13 represent between 1% and 10% of the total use in Norwegian sports implies that the sale for doping purposes in 1975 was between 2.4% and 24% of the total sale that year.

A tentative conclusion is that the doping tests may have had their intended effect, namely a reduction in the use of anabolic steroids by athletes, and a slower rate of result improvements. Testosterone sale has decreased slightly in recent years. This development gives no support to the theory that introduction of doping tests for anabolic steroids would switch the problem to abuse of testosterone.

REFERENCES

- Fahey, T. D. and Brown, C. H., 1973 "The effects of an anabolic steroid on the strength, body composition, and endurance of college males when accompanied by a weight training programme". *Med.Sci.Sports* 5 (4): 272-276.
- Forsdahl, A., 1981 "Utvikling av høyde og vekt hos voksne menn og kvinner i Norge i 1970-årene". *Tidsskr.Nor. Lægeforen.* 101: 559-562.
- Freed, D. L. J., Banks, A. J., Longson, D. and Burley, D. M., 1975 "Anabolic steroids in athletics: Crossover double-blind trial on weightlifters". *Brit.Med.J.* 2: 471-473.
- Haug, J. and Ingvaldsen, R., 1974 "Noen synspunkter på bruken av hormonpreparater blant aktive idrettsutøvere". Institute of Psychology, University of Oslo, Norway.
- Ljungqvist, A., 1975 "The use of anabolic steroids in top Swedish athletes". *Brit.J.Sports Med.* 9 (2): 82.
- Nielsen, A., Hilden, J. and Fenger, K., 1976 "Statistik og sandsynlighed -anvendt i medicin". FADL's-Forlag, Copenhagen.
- Solberg, S., 1974. Unpublished data.
- Statistical Yearbook, 1979, table 62. Central Bureau of Statistics in Norway, Oslo.
- Strømme, S. B., Meen, H. D. and Aakvaag, A., 1974 "Effects of an androgenic-anabolic steroid on strength development and plasma testosterone levels in normal males". *Med.Sci.Sports Exerc.* 6 (3): 203-208.