

Management of steroid as a threatening factor to the health of the Thai population

1) Definition/meaning

“Steroid” is a chemical substance very useful for several medical applications, such as relief of allergy or inflammation. It is used in the treatment of disorders caused by abnormal immunity. It is commercially available in many forms, oral, injectable, and transdermal. However, its use may lead to serious health hazards and, therefore, needs to come under the physician’s supervision. Steroid abuse is commonly seen in the corticosteroid group, especially dexamethasone and prednisolone available in diverse forms such as polypharmacy or as an ingredient of a bolus, herbal medicine, health drink or cosmetic.

“Food supplements” refer to dietary products consumed in addition to regular diets to provide nutrients in the forms of capsule, powder, grain, liquid, or others. They are intended for normal healthy persons, and not for patients; they should not be given to children and pregnant women.

2. Background/rationale

Steroid is so commonly found in polypharmacy, herbal medicine and dietary supplements that people can easily buy from mobile sale units, grocery stores, and drug stores. The users have unknowingly been long addicted to it. This is a long-drawn complex problem with wide-ranging effects, especially in people with low education and low income, who are considered the country’s backbone. It is found that disorders caused by steroid abuse without medical indication have been chronic problems for more than 30 years and the situation has worsened.

2.1 Impacts on health

In general, out of 1,000 people there are about 93 with clinical problems on account of inappropriate steroid use, and the mortality rate is 6.4%. Some of the clinical problems are Cushing’s syndrome (48/1,000), metabolic disorders (43/1,000), and adrenal insufficiency (9/1,000), while infection and gastrointestinal bleeding are 4.8 and 3 times more likely respectively compared to non-steroid users. Such problems are widespread in every region of the country (100, 61, 96, 101, 131 cases per 1,000 are found in the northern, northeastern, central, northern, and southern regions respectively.)¹

2.2 Direct costs from steroid use without medical indication

According to an economic estimation, steroid patients without medical indication spend 3.67 days per stay in the hospital, 2.19 days longer than other groups of patients, with additional expenses of 4,455 baht or 1,900 million baht per year.²

2.3 Manufacturing and distribution of steroid

The steroid problem in Thailand is found in the use of prednisolone and dexamethasone. In 2011 it was found that there were 54 prednisolone manufacturing companies with 128 formularies, while the year 2012 saw the manufacturing and importation of 198 million ready-made pills/capsules with prednisolone as ingredient and 557 pills/capsules with dexamethasone as ingredient. (Table 1)

Table 1: Manufacturing and importation of ready-made pills/capsules with prednisolone and dexamethasone as ingredients during 2008-2012: unit million pills/capsules

drug	2008	2009	2010	2011	2012
prednisolone	223	217	207	257	198
dexamethasone	314	305	417	556	557
Total	537	522	624	813	755

According to the 1998 drug distribution (January-April), out of 28.44 million prednisolone pills or 46.1% distributed to hospitals and clinics in the country, 53.8% were used inappropriately, while 1198.1 dexamethasone pills or 2.6% distributed to hospitals and clinics in the country 97.4% were used inappropriately. This is in line with the information that little dexamethasone in hospitals was prescribed to patients. Because of its serious side effects, it was not often used in treatment. It was estimated that a lot of dexamethasone drugs manufactured in the country were used outside the hospital setting to produce polypharmacy or bolus/herbal medicine.³

On comparing the patterns of prednisolone and dexamethasone distributions in 2014 (Table 2), it is found that, despite the report on steroid distribution produced by the manufacturers to these establishments with the intention to reduce the possibility of abuse, there is no clear-cut collection of information on the steroid drug distribution from the establishments to the patients. This makes it impossible to conduct a systemic check on the quantities of manufactured/imported and distributed (received-dispensed-remaining) drugs. It is, therefore, possible that part of the drugs were likely to get away and be inappropriately used. According to the monitoring conducted by agencies concerned, it is found that currently many health products are adulterated with these two types of steroid drugs, such as unregistered traditional medicine and dietary supplements.

Table 2L Report on prednisolone and dexamethasone drug distribution

Distribution source	prednisolone		dexamethasone	
	Jan.-April 2008 Million pills (%)	Oct. 2013-Aug. 2014 Million pills (%)	Jan.-April 2008 Million pills (%)	Oct. 2013-Aug. 2014 Million pills (%)
1.Domestic	28.44	110.60	118.1	15.40
1.1 Hospital	(15.0.)	43.47 (39.30)	(0.8)	1.98 (12.87)
1.2 Clinic	(31.1)	55.93 (50.57)	(1.8)	8.60 (55.87)
1.3 Drug store	(11.8)	11.20(10.12)	(3.2)	4.81 (31.26)
1.4 Company	(42)	-	(94.2)	-
2. Exported	1.16	17.59	22.3	380.73
3.Total	29.6	128.19	141.5	396.13

Source: Report system developed by Food & Drug Administration: FDA Reporter and drug sale report as shown in Drug Sale Form (Kho Yo) 8

2.4 Drug user behavior

In Ratchata Ratchatanawin et al (2007) the types of drugs most chosen and used by patients are polypharmacy (26.3%), traditional herbal medicine (23.5%), and bolus

(21.8%) respectively. The main reason given for such drug use is to cure muscle and joint pains (43.6%).

After 2010 there was a more widespread of traditional medicine in liquid form adulterated with steroid together with an increased number of new manufacturers. Interestingly, during the three years of reduced use of steroid in the system a new type of problems occurred outside the supervisory system. More steroids from a lot of unidentified sources were commercially available from mobile sale units and were added to various health products such as herbal beverages, candies, and cosmetics;⁴ thus the consumers took steroid unknowingly.

2.5 Results of the testing of steroid-mixed products

The laboratory of the Bureau of Drug and Narcotic, Department of Medical Sciences, received samples of herbal products, e.g. powdered drug, bolus, herbal potion, medicinal mixture, and capsule, from the general public and public agencies charged with monitoring responsibility. The information collected from 2010 to 2014 reveals that out of 670 tested samples steroid substance was found, i.e. prednisolone and/or dexamethasone. Even some 118 modern drugs (17.6%) (Table 3) are found to be adulterated with steroid. All adulterated tested samples are non-registered drugs, with more dexamethasone than prednisolone, e.g. paracetamol, phenylbutazone, diclofenac, indomethacin, chlorpheniramine, and diazepam.⁵

Table 3: Results of testing of steroid-adulterated traditional drugs, mostly without pharmacopeia, by Department of Medical Science laboratory

Budgetary year	Total number of samples/those found to contain steroid (%)	Category of samples found with steroid (samples)		
		dexamethasone and other substances	prednisolone and other substances	dexamethasone + prednisolone and other substances
2010	190/31 (16.3)	22	3	6
2011	133/29 (21.8)	24	2	3
2012	161/35 (21.7)	27	2	6
2013	125/16 (12.8)	8	0	8
2014	61/7 (11.5)	4	0	3
Total	670/118 (17.6)	85	7	26

3. Current policy and measures

3.1 Legal measures

Ever since 2007 Thailand's Food and Drug Administration has advocated amending the following three legal regulations relating to drug distribution control to ensure greater efficient control of steroid distribution:

1. Ministerial regulation on registration of pharmacopoeia B.E. 2555 (2012) requires authorized drug manufacturers, importers or order makers to register their pharmacopeia, put symbols on the pills to reduce the possibility of drug abuse due to public ignorance, promote law enforcement, and make the situation better known to the public.
2. Ministerial regulation sets the function of the authorized persons on the use of pharmaceuticals as active ingredients or as semi-finished products with active ingredients B.E. 2555 (2012) to control the importation of pharmaceuticals.
3. Ministerial regulation on the authorization and issuance of license for selling medicinal products B.E. 2556 (2013) has provisions about controlling the wholesale of finished drugs, both manufactured and imported, and requiring some form of reporting online about their sales through the FDA Reporter system.

The three ministerial regulations, however, take time before they come into effect, as they depend on the passage of other secondary law, ministerial regulations, and Food and Drug announcement and have to go through the process of good regulatory practice (GRP). In this connection the Food & Drug Administration has taken a number of measures and asked the operators for cooperation for some time now.

3.1.1 Problems and obstacles encountered⁶

1. Importation through customs stations and border checkpoints

With regard to imported chemicals used in steroid production and imported finished steroids/pharmaceuticals, it is found that false information is intentionally given. Attempts have been made to avoid declaring importation, saying that the material is intended for production of animal feed, animal medication or other chemicals. Some are smuggled via temporary border checkpoints in various areas where inspection procedure is not vigorously imposed.

2. Steroids produced from pharmaceutical companies

Food and Drug Administration has issued requirements that all steroid importers and manufacturers everywhere report the production, importation, and distribution of drugs and chemicals used in the production, as well as FDA Reporter Raw Material to Product, to the FDA. The monitoring on steroid manufacturing, importation, and distribution reveals that 1) only unfinished steroids have labels, 2) some steroids are without pharmacopoeia serial numbers, 3) steroid substance is found in NSAIDS medicinal jars, e.g. in properly sealed Piroxicam jars with plastic covering unbroken. This is in line with another monitoring report that a number of manufacturing sources smuggled imported chemicals for use in steroid production and distributed them to drug stores, especially those of Category 2 and some groups of clinics.

3. Distribution from manufacturing sources

With regard to steroid distribution to various areas, it is found that there are "drug cells" acting as agents importing, acting as middlemen and distributing steroid to drug stores or clinics in the form of "white bills". There is evidence that these drug cells serve as centers of coordination for a number of plants that "copy" drugs manufactured by other commercial companies or remake them in different colors and shapes.

4. Regulatory system

The regulatory system in the format of FDA Reporter Raw Material to Finished Product is designed by Food and Drug Administration to regulate and monitor the

importation, manufacturing and distribution of drugs and serves to a certain extent as an effective tool. However, there is no reporting of the illegal flow of imported and manufactured steroid yet. With no clear management system, it is possible that this risk will become another critical point in the system leading to steroid spill-over with no real solution in sight.

5. Care System for steroid-ingested patients⁷

So far solution tended to focus on the drug distribution sources, while little attention was given to the care given to steroid patients. Local research findings recommend that a system be developed to screen and provide care for patients in the community facing steroid hazards, emphasizing that such risk population gets easy access to steroid and unknowingly is exposed to the substance.

3.2 Technical and social measures

Attempts have been made to apply the knowledge and research findings to the development of steroid problem management at various levels. The application ranges from researches into the condition and size of the problem, caused by steroid misuse/abuse among drug users, to the severity of the widespread of steroid use in health products, such as medicine, food and cosmetics. Despite many studies undertaken over the years, current studies confirm that the situation has not changed in any substantial way.

In addition, the severity of the widespread of steroid-adulterated health products has prompted health professionals, especially pharmacists, to hasten to conduct studies on the impacts on consumers of such products. They take such actions as developing a screening system for patients suffering from steroid ill-effects in the community. The work involves coordination and networking in matters ranging from patient screening by village health volunteers, referral of cases to health workers in Tambon health promotion hospitals and community hospitals for further healthcare when the patients have found themselves in danger and want to stop using the dangerous substance without going through too much withdrawal syndrome. The ultimate aim is to come up with an important model for local screening use, or sometimes known as local scanning model. The model, initiated in Amphoe Khukhan, Si Sa Ket Province, has spread to other districts throughout I-san and some parts of the northern region.

In solving the steroid problem over the years, health professionals in various fields have worked with a number of partner networks, e.g. Association of Community Pharmacists, medical experts in various disciplines, Village Health Volunteers' Club of Thailand, grievance centers, consumer protection networks, Moh-Chao-Ban Foundation, Family Network Foundation, Medical Sciences Centers, Rural Pharmacists' Club, Plan to develop mechanisms for drug watch and Plan for technical development and health consumer protection mechanisms. They also work with universities interested in the issues through concrete activities including advocating campaigns for appropriate and safe reduction of steroid use and initiating projects on steroid management by the community, project on developing monitoring models for steroid abuse in Region 5, projects on developing a monitoring mechanism for the distribution of steroid-adulterated health products in 20 provinces in the northeastern region, projects on screening of steroid-using chronic patients without medical indication in Amphoe Warin Chamrap, Ubon Ratchathani Province.^{8,9}

Besides, the networks educate the public on steroid through a number of channels, such as printing media, radio, and social media, making use of applications

development, warning systems, and database on safe health products⁶ to facilitate greater public access to information on steroid.

In the current 2015 budgetary year the Ministry of Public Health has developed a plan that integrates consumer protection for safe drug use in the community to ensure no use of non-prescribed steroid drugs or steroid-contaminated health products. The main agencies responsible for the execution are Food and Drug Administration and the provincial public health offices. The goal for the first year is for each province to have at least one Tambon undertake activities as follows: conduct projects for use of safe drugs in the community, develop the drug use capacity of households and schools, monitor and control drug distribution sources in the community, screen patients suffering from drug use and refer them for proper treatment, and organize activities conducive to learning and exchange of experiences. All this is designed to stimulate the community to develop self-managed mechanisms for the next phase.

3.3 Constraints

1. The suppression of steroid adulteration involves investigations looking for evidence. Meanwhile, Food and Drug Administration is not a security agency and cannot request, therefore, a budget to do necessary work, including a classified confidential budget and the hiring of investigators to do the work that civil servants are not competently trained for. The following are some of the constraints:

1. Legal constraints and complicity of working relationships between several agencies that need to work as an efficient and active network, such as those found between security agencies, Consumer Protection Police Bureau, and Customs Department responsible for the release of goods.
2. Illegal smuggling from one area of the province to another.
3. The existing information system and steroid database cannot be cross-checked in an efficient and continual manner.

4. Issue to be submitted for consideration to the National Health Assembly

Requesting the Health Assembly to consider Document Health Assembly 7/
Draft Resolution 2 on Management of steroid as a threatening factor to the health of the Thai population

Reference

¹Ratchata Ratchatanawin et al (2007). Study on the prevalence of overt manifestation of steroid abuse without medical indication (complete study report). Bangkok: Thailand Research Fund.

²Phetcharat Phoncharoensuk, Krittiya Chuen-ngu-Lueam, Ammarin Thakkhinsathia, Ratchata Ratchatanawin. Study on direct cost from steroid use without medical indication in Thailand. *Warasan Phesatchakam Rong Phayaban (Journal)*, Vol. 17, supp. (June, 2007).

³Pharmacist Naowarat thip-Uthai (2013). Project: Study on views on measures to set forms or symbols of steroid oral pills: Plan for technical development and health consumer protection mechanisms

⁴Warning database system on the quality and safety of health products, Department of Medical Sciences <http://tumdee.org/alert/index.php>.

⁵Masawalai Likhithanaset. Report on the laboratory situation on the results of steroid testing in traditional medicine, Bureau of Drug and Narcotic, Department of Medical Sciences (12 September 2014).

⁶Suphanai Prasoetsuk et al. Project: Development of a system to monitor distribution of steroid-adulterated health products in the Northeastern Region in 2014, Northeastern Consumer Protection Network and Steroid Problem Management Network: Food and Drug Administration and Plan to develop mechanisms for drug watch.

⁷Project: "Steroid management by community networks, Plan to develop mechanisms for drug watch.

⁸Phanuchot Thongyang et al. Do not let steroid go scotch free, Plan to develop mechanisms for drug watch and development (August, 2012).

⁹Rungnapha phawong (2013). Project: Screening chronic patients of steroid use without medical indication, Warinchamrap District, Ubon Ratchathani Province: Project for technical development and health consumer protection mechanisms.